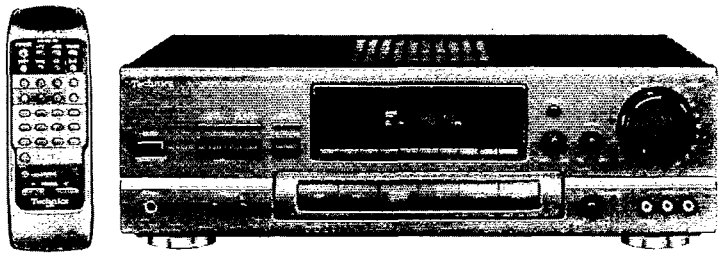
ORDER NO. AD9405119C8
A2

Service Manual

AV Control Stereo Receiver

Receiver

SA-GX170



Colour

(K) ... Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	
(EP)	Poland.	
(G)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output
- **DIN 1 kHz (T.H.D. 1%)**
- **[at 240 V for (E, EB, EG, EP) areas.]** 2×80 W (4 Ω)
- **[for (G, GN) areas.]** 2×80 W (8 Ω)
- **40 Hz–20 kHz continuous power output both channels driven** 2×60 W (8 Ω)

Total harmonic distortion
- **rated power at 40 Hz–20 kHz** 0.5% (8 Ω)
- **half power at 1 kHz** 0.03% (8 Ω)

Intermodulation distortion
- **rated power at 60 Hz: 7 kHz=4:1, SMPTE** 0.5% (8 Ω)

Power bandwidth
- **both channels driven, −3 dB** 10 Hz–40 kHz (8 Ω)

Damping factor 40 (8 Ω)

Input sensitivity and impedance
- **PHONO** 3 mV/47 kΩ
- **CD, VCR 1, VCR 2, TAPE/DCC** 200 mV/22 kΩ

S/N at rated power (8 Ω)
- **PHONO** 70 dB (IHF, A: 80 dB)
- **CD, VCR 1, VCR 2, TAPE/DCC** 80 dB (IHF, A: 90 dB)

Frequency response
- **PHONO** RIAA standard curve (30 Hz–15 kHz) ±0.8 dB
- **CD, VCR 1, VCR 2, TAPE/DCC** 10 Hz–40 kHz, ±3 dB

Tone controls
- **BASS** 50 Hz, +10 to −10 dB
- **TREBLE** 20 kHz, +10 to −10 dB

Output voltage
- **VCR 1 OUT, TAPE/DCC REC (OUT)** 200 mV

Channel balance (250 Hz–6.3 kHz) ±1 dB

Channel separation 55 dB

Headphones output level and impedance 430 mV/330 Ω

Load impedance
- **A or B** **[For (E, EB, EG, EP) areas.]** 4–16 Ω
- **[For (G, GN) areas.]** 8–16 Ω
- **A and B** 8–16 Ω

■ FM TUNER SECTION

Frequency range 87.50–108.00 MHz

Sensitivity
- **S/N 30 dB** 1.5 µV/75 Ω
- **S/N 26 dB** 1.3 µV/75 Ω
- **S/N 20 dB** 1.2 µV/75 Ω

IHF usable sensitivity (IHF '58) 1.5 µV/75 Ω

IHF 46 dB stereo quieting sensitivity 22 µV/75 Ω

Total harmonic distortion
- **MONO** 0.2%
- **STEREO** 0.3%

S/N
- **MONO** 60 dB (75 dB, IHF)
- **STEREO** 58 dB (71 dB, IHF)

Frequency response 20 Hz–15 kHz, +1 dB, −2 dB

Alternate channel selectivity
- **±400 kHz** 65 dB

Capture ratio 1.0 dB

Image rejection at 98 MHz 40 dB

IF rejection at 98 MHz 70 dB

Spurious response rejection at 98 MHz 70 dB

AM suppression 50 dB

Stereo separation
- **1 kHz** 40 dB

Carrier leak
- **19 kHz** −30 dB (−35 dB, IHF)
- **38 kHz** −50 dB (−55 dB, IHF)

Channel balance (250 Hz–6.3 kHz) ±1.5 dB

Limiting point 1.2 µV

Bandwidth
- **IF amplifier** 180 kHz
- **FM demodulator** 1000 kHz

Antenna terminal(s) 75 Ω (unbalanced)

Technics

■ AM TUNER SECTION

• For (E, EB, EP, G, GN) areas.

Frequency range	
MW	522−1611 kHz (9 kHz steps) 530−1620 kHz (10 kHz steps)
LW	144−288 kHz
Sensitivity	
MW	20 µV, 300 µV/m
LW	45 µV
Selectivity	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 252 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB

• For (EG) area.

Frequency range	522~1611 kHz (9 kHz steps) 530~1620 kHz (10 kHz steps)
Selectivity (S/N 20 dB)	20 µV, 330 µV/m
Selectivity at 999 kHz	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ GENERAL

Power consumption	
[For (E, EB, EG, EP) areas.]	160 W
[For (G, GN) areas.]	150 W
Power supply	
[For (E, EB, EP, GN) areas.]	AC 50/60 Hz, 230−240 V
[For (EG) area.]	AC 50/60 Hz, 230 V
[For (G) area.]	AC 50/60 Hz, 110−127 V/220−240 V
Dimensions (W × H × D)	430 × 136 × 305 mm
Weight	6.6 kg

■ REMOTE CONTROL TRANSMITTER

Control keys	32 keys
Dimensions (W × H × D)	62 × 24.5 × 176 mm
Weight (including batteries)	104 g (3.1 oz)
Power source	Two UM-4 (Panasonic R03/LR03 or equivalent)

Notes:

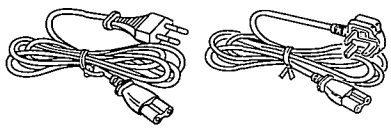
1. Design and specifications are subject to change without notice.
   Weight and dimensions are approximate.
2. Total harmonic distortions is measured by the digital spectrum analyzer.

■ CONTENTS

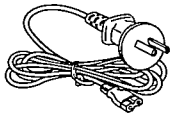
	Page
ACCESSORIES	**2**
CAUTION FOR AC MAINS LEAD	**3**
FRONT PANEL CONTROLS	**4**
EQUIPMENT CONNECTIONS	**5, 6**
REMOTE CONTROL OPERATION	**7**
PROTECTION CIRCUITRY	**7**
BEFORE REPAIR AND ADJUSTMENT	**7**
DISASSEMBLY INSTRUCTIONS	**8~10**
HOW TO REPLACEMENT THE POWER IC AND REGULATOR TRANSISTOR	**11, 12**
HOW TO CHECK THE MAIN P.C.B.	**13**
REPLACEMENT OF THE FOOT	**13**
TERMINAL FUNCTION OF IC	**14**
FAN MOTOR TROUBLESHOOTING GUIDE	**15**
SCHEMATIC DIAGRAM	**16~27**
BLOCK DIAGRAM	**27~29**
PRINTED CIRCUIT BOARDS	**30~34**
WIRING CONNECTION DIAGRAM	**35**
CABINET PARTS LOCATION	**36, 37**
REPLACEMENT PARTS LIST	**38~40, 44**
RESISTORS AND CAPACITORS	**41~43**
PACKAGING	**44**

■ ACCESSORIES

AC power supply cord..... 1 pc.
[RJA0019-2K (E, EG, EP, G)] [VJA0733 (EB)]



[RJA0036-K (GN)]

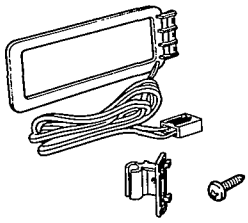


FM indoor antenna ..... 1 pc.
(RSA0007)

Attachment plug..... 1 pc.
[SJP9009 (EB)]

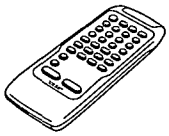
AM loop antenna set..... 1 pc.
(RSA0010)

- AM antenna holder..... 1 pc.
  (RMN0244)
- Screw..... 1 pc.
  (XTN3+10AFZ)

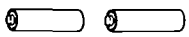


Power plug adaptor..... 1 pc.
[SJP5213-1 (G)]

Remote control transmitter ..... 1 pc.
(RAK-SA113XH)

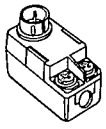


Batteries..... 2 pcs.
(UM-4, "AAA", R03)



Note: These are available on sale route.

Antena plug..... 1 pc.
[RFE0014 (G, GN)]



■ CAUTION FOR AC MAINS LEAD

("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ♡ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

CAUTION!
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

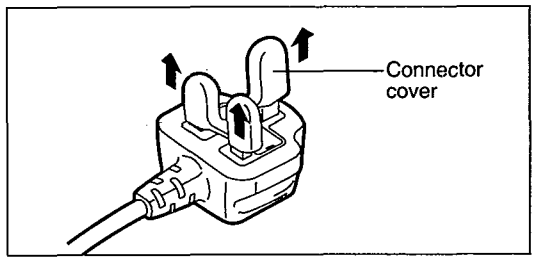
As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

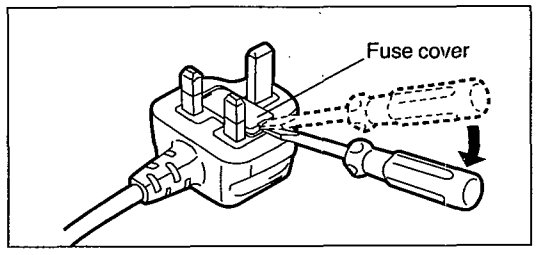
Before use

Remove the connector cover as follows.

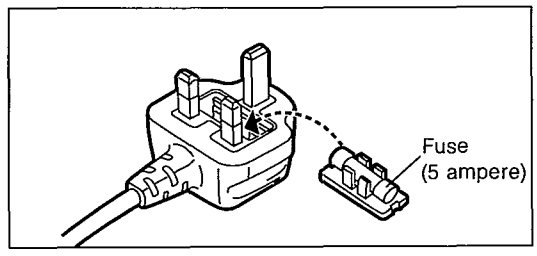


How to replace the fuse

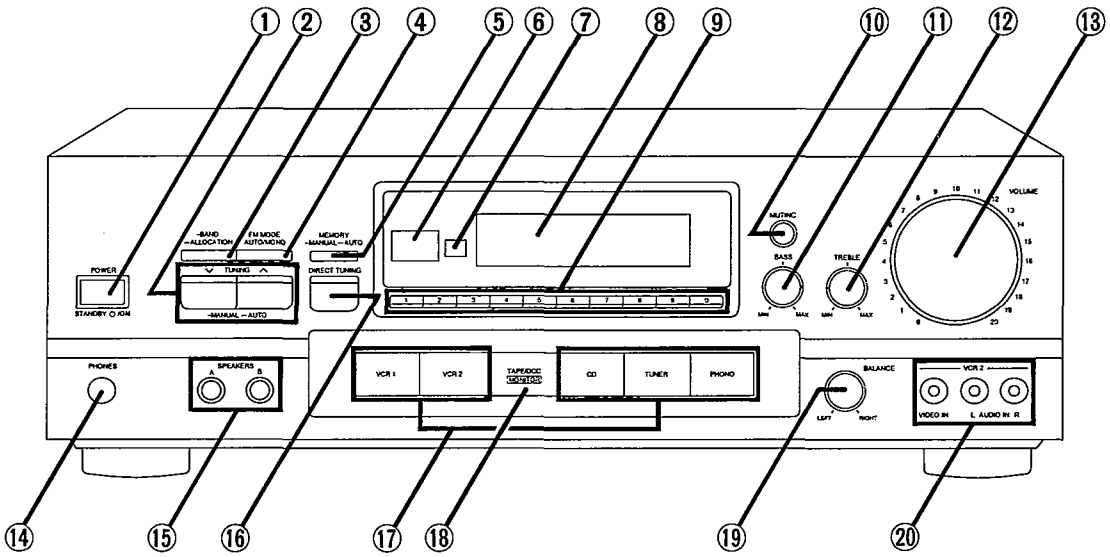
1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



■ FRONT PANEL CONTROLS

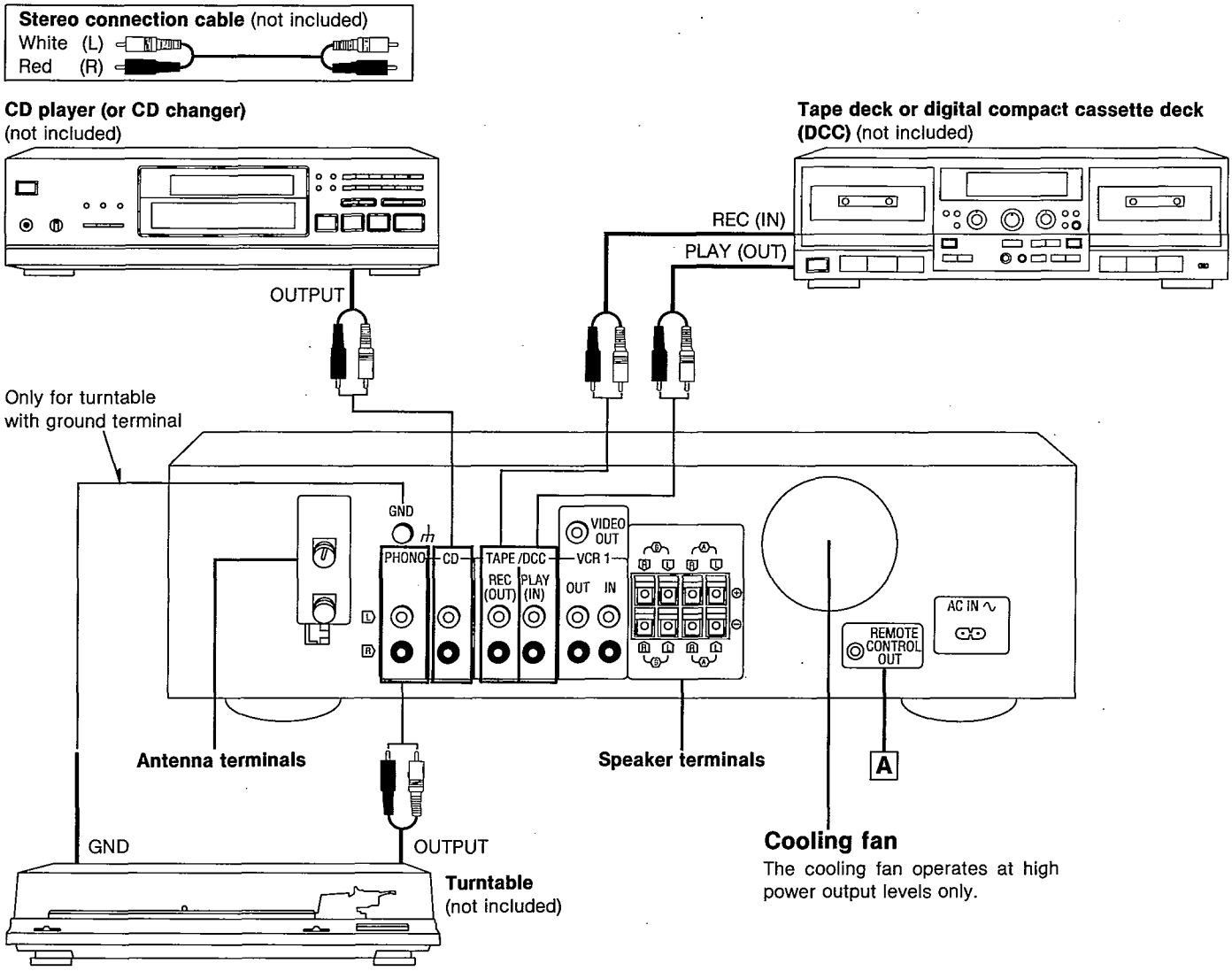


No.	*Name*
①	**Power "STANDBY ⏻ /ON" switch (POWER, STANDBY ⏻ /ON)** Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	**Tuning buttons (TUNING)**
③	**Band select button (BAND)**
④	**FM mode select button (FM MODE)**
⑤	**Memory button (MEMORY)**
⑥	**Remote control signal receptor**
⑦	**"STANDBY" indicator** When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.
⑧	**Display**
⑨	**Numeric buttons (1 – 0)**
⑩	**Muting button (MUTING)**

No.	*Name*
⑪	**Bass control (BASS)**
⑫	**Treble control (TREBLE)**
⑬	**Volume control (VOLUME)**
⑭	**Headphone jack (PHONES)**
⑮	**Speaker select buttons (SPEAKERS)**
⑯	**Direct tuning button (DIRECT TUNING)**
⑰	**Input select buttons**
⑱	**Tape/DCC monitor button (TAPE/DCC MONITOR)**
⑲	**Balance control (BALANCE)**
⑳	**VCR 2 input terminals (VCR 2)**

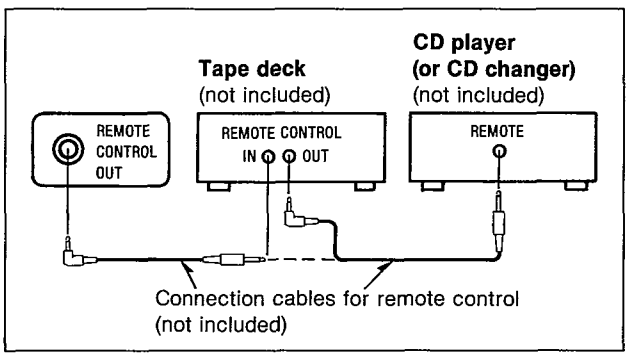
■ EQUIPMENT CONNECTIONS

Connecting audio equipment



A "REMOTE CONTROL OUT" terminal

Connect the connection cable for the remote control to a Technics tape deck and/or CD player (or CD changer) which has the appropriate remote control terminal as shown below. If a tape deck is not being used, the CD player (or CD changer) can be connected directly (dotted line).



For a CD player (or CD changer) with a remote control sensor the above connection is not necessary.

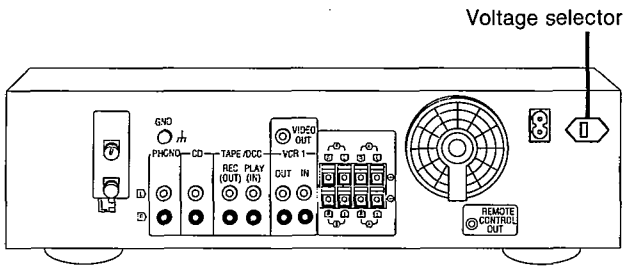
To set the power voltage

[For (G) area only.]

Set the voltage selector to the voltage setting for the area in which the unit will be used.

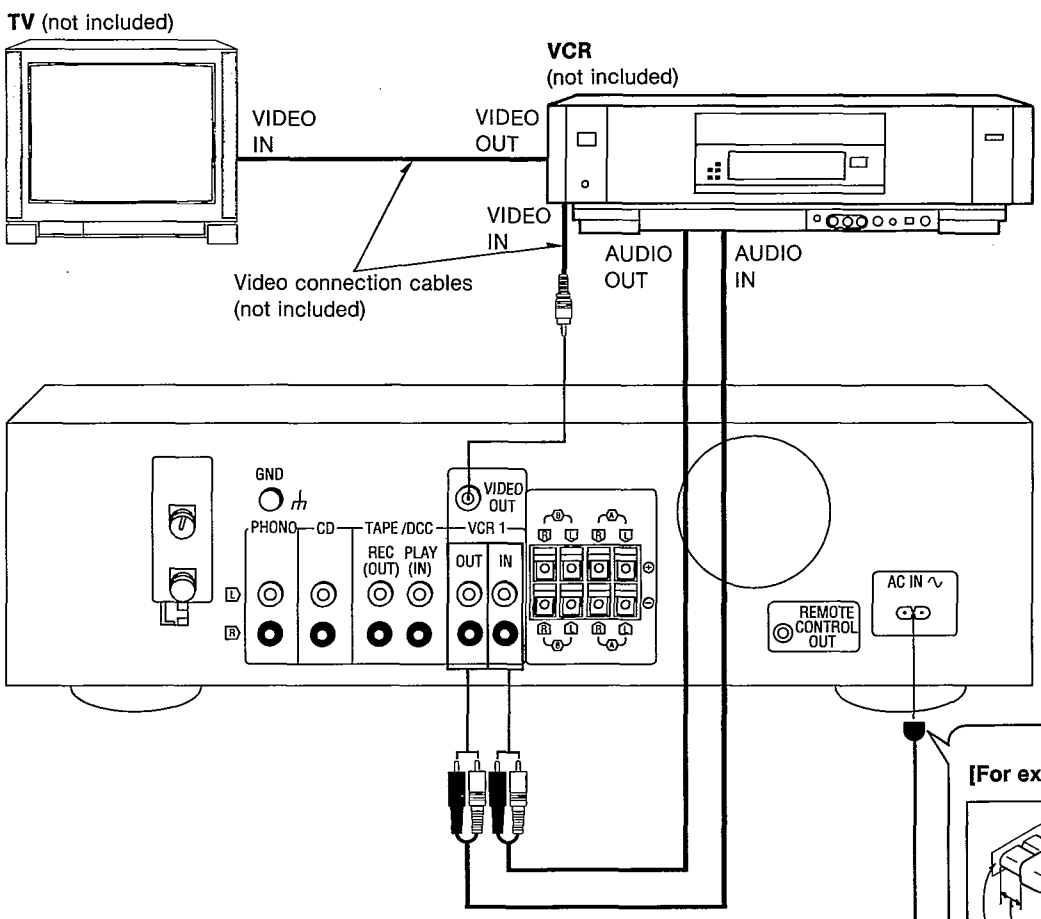
Note

Note that this unit will be seriously damaged if this setting is not made correctly.

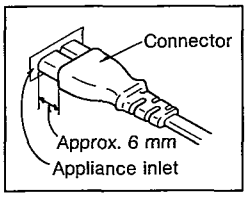


Connecting video equipment

Stereo connection cable (not included)
White (L)
Red (R)



[For except (GN) area only.]



Even when the connector is perfectly inserted, the front part of the connector jut out as shown in the drawing. However there is no problem using the unit.

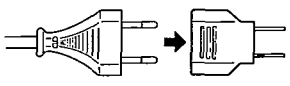
AC power supply cord (included)

Connect this cord after all other cables and cords are connected.

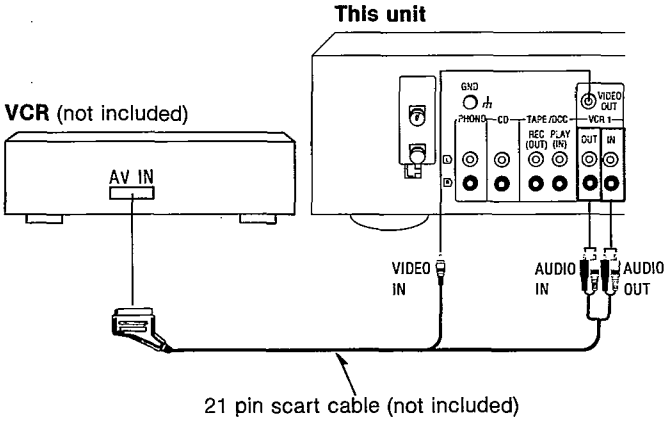
Household AC outlet

[For (EB) area only.]
BE SURE TO READ THE CAUTION FOR THE AC POWER SUPPLY CORD ON PAGE 3 BEFORE CONNECTION.

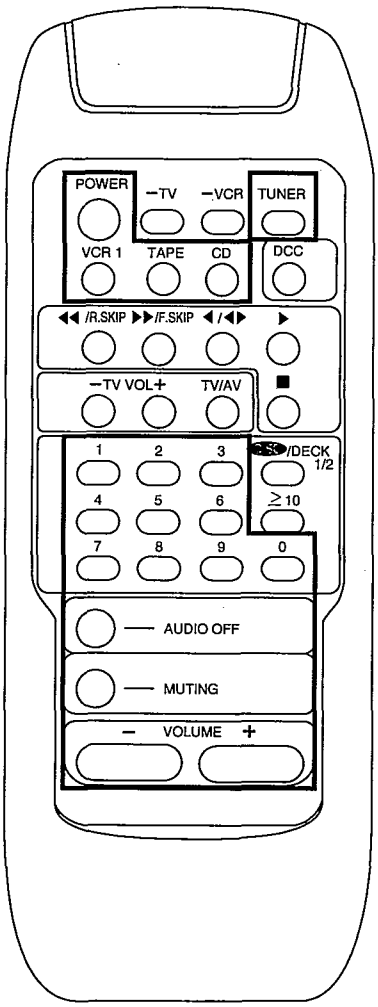
[For (G) area only.]
If the power plug will not fit your socket, use the power plug adaptor (included).



To connect a video deck with 21 pin scart terminal



■ REMOTE CONTROL OPERATION



Basic operations

To turn the unit ON/OFF	POWER ○
To turn the tape monitor function ON	TAPE ○ To turn off the tape monitor function, press one of the input select buttons (TUNER, CD, VCR 1).
To select an input source	TUNER ⬭ CD ○ VCR 1 ○
To mute the sound level	○ — MUTING Press once more to return to the original volume.
To adjust the volume level	– VOLUME + ⬭ ⬭
If your unit is equipped with the New Technics Remote Control System (see below)	
To turn the system OFF	○ — AUDIO OFF

To listen to radio broadcasts

TUNER ⬭ ➡ 1 2 3 / 4 5 6 / 7 8 9 0

Specify the preset channel using the numeric button(s).

(Example: Channel 12)
1 ⬭ ➡ 2 ⬭
Within 2 sec.

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:
- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:
1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (56V 4700μF/75V 7500μF), C705 and C706 (50V 4700μF/50V 2200μF) through a 10Ω, 5W resistor to ground.
DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may distroy solid state devices.
After repairs are completed, restore power gradually using a variac, to avoid overcurrent.
Current consumption at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage AC 230V/240V.

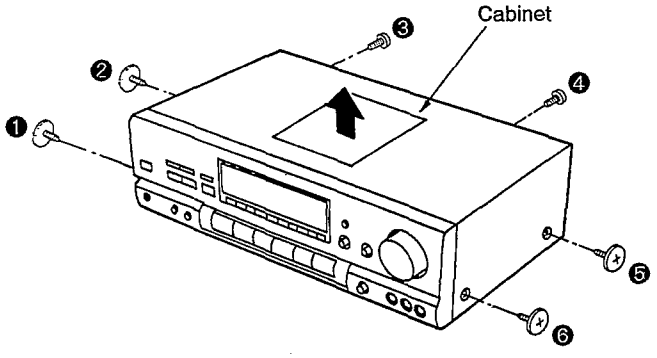
Power supply voltage	AC 230V		AC 240V		AC 110–127V		AC 220–240V	
Consumed current 50/60Hz	50Hz	120~350mA	50Hz	130~380mA	50Hz	250~700mA	50Hz	120~350mA
	60Hz	96~280mA	60Hz	104~304mA	60Hz	200~560mA	60Hz	96~280mA

■ DISASSEMBLY INSTRUCTIONS

"ATTENTION SERVICER"
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref.No. 1	Removal of the cabinet

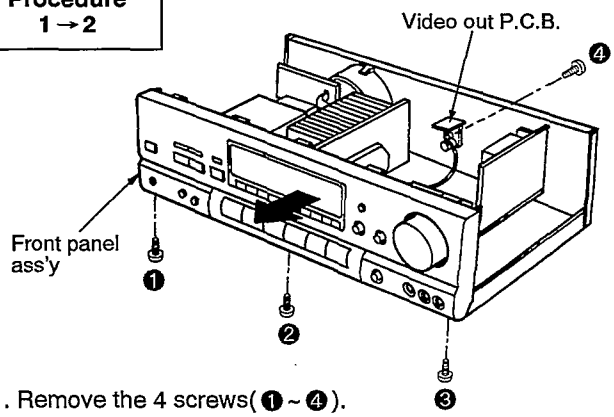
Procedure 1



• Remove the 6 screws(❶~❻).

Ref.No. 2	Removal of the front panel ass'y and video out P.C.B.

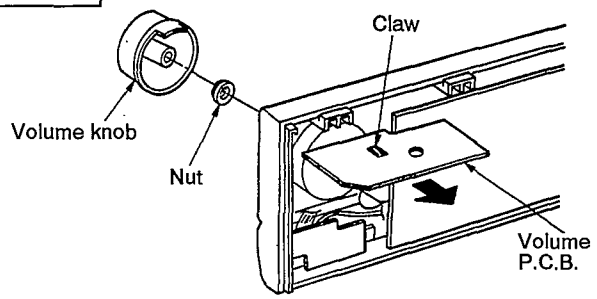
Procedure 1→2



1. Remove the 4 screws(❶~❹).
2. Remove the video out P.C.B..
3. Remove the front panel ass'y in the direction of arrow.

Ref.No. 3	Removal of the volume P.C.B.

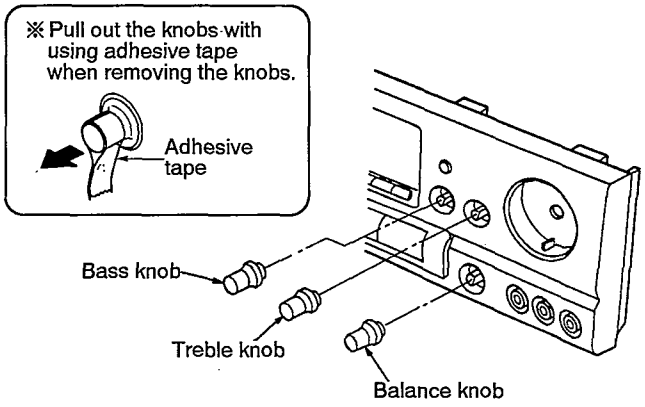
Procedure 1→2→3



1. Pull out the volume knob.
2. Remove the nut.
3. Release the 1 claw.
4. Remove the volume P.C.B. in the direction of arrow.

Ref.No. 4	Removal of the operation P.C.B. and headphones jack P.C.B.

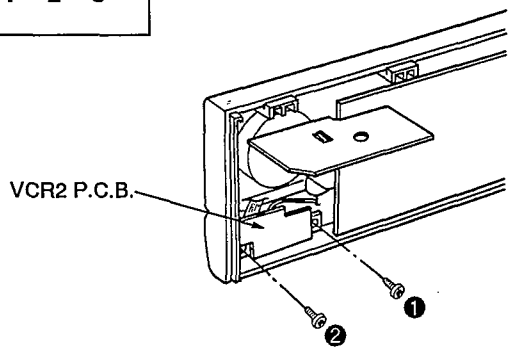
Procedure 1→2→3→4



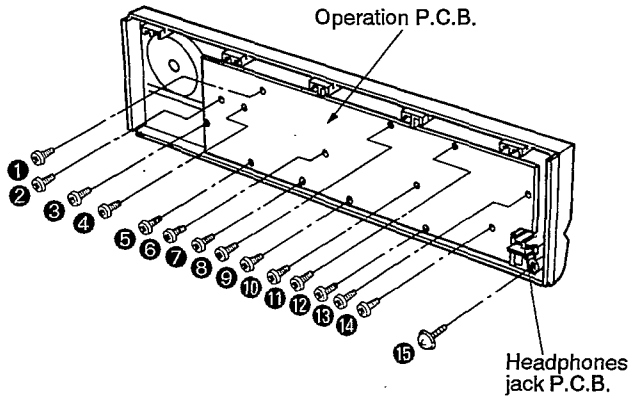
1. Pull out the balance knob, bass knob and treble knob.

Ref.No. 5	Removal of the VCR2 P.C.B.

Procedure 1→2→5



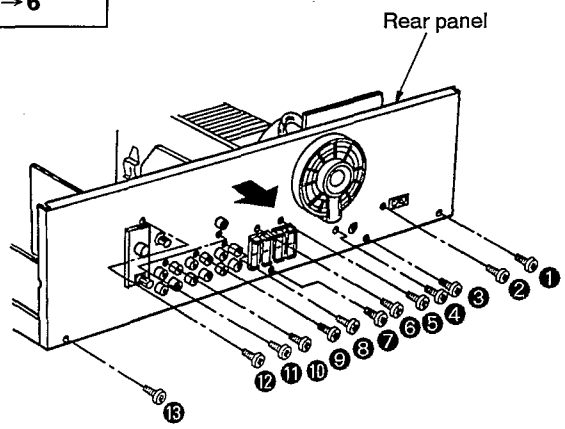
• Remove the 2 screws(❶, ❷).



2. Remove the 15 screws(❶~⓯).

Ref.No. 6	Removal of the rear panel

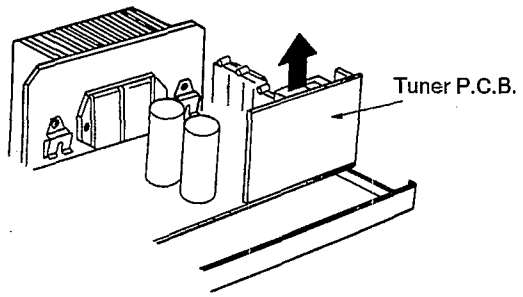
Procedure 1→6



1. Remove the 13 screws(❶~⓭).
2. Remove the rear panel in the direction of arrow.

Ref.No. 7	Removal of the tuner P.C.B.

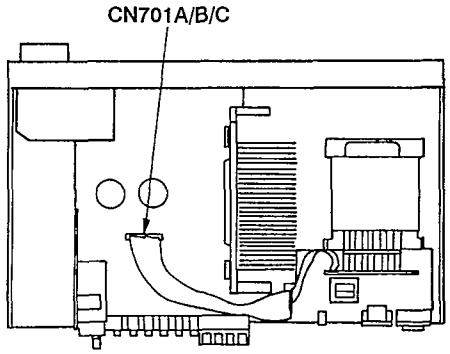
Procedure 1→6→7



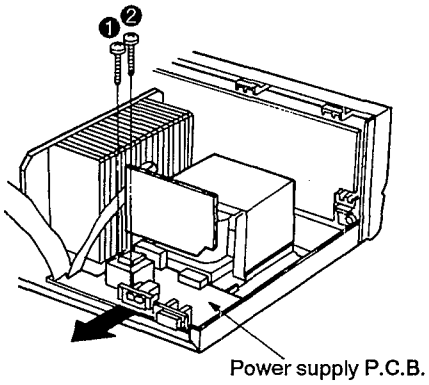
- Remove the tuner P.C.B. in the direction of arrow.

Ref.No. 8	Removal of the power supply P.C.B.

Procedure 1→6→8



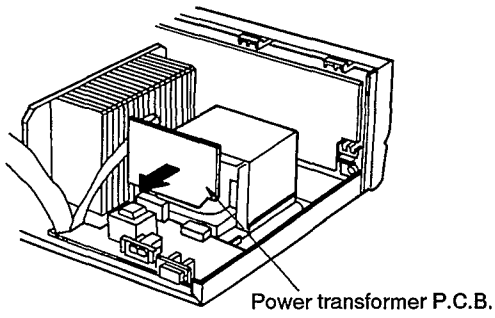
1. Remove the 1 flat cable(CN701A/B/C).



2. Remove the 2 screws(❶, ❷).
3. Remove the power supply P.C.B. in the direction of arrow.

Ref.No. 9	Removal of the power transformer P.C.B.

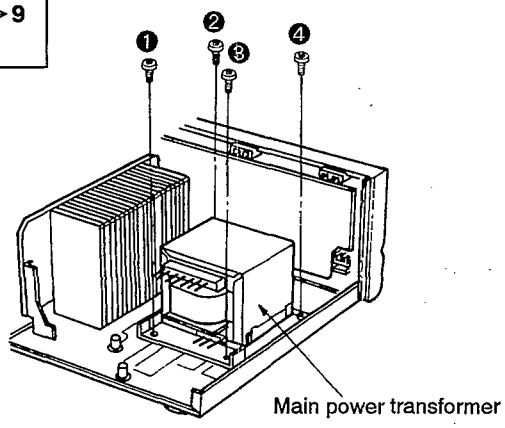
Procedure 1→9



- Remove the power transformer P.C.B. in the direction of arrow.

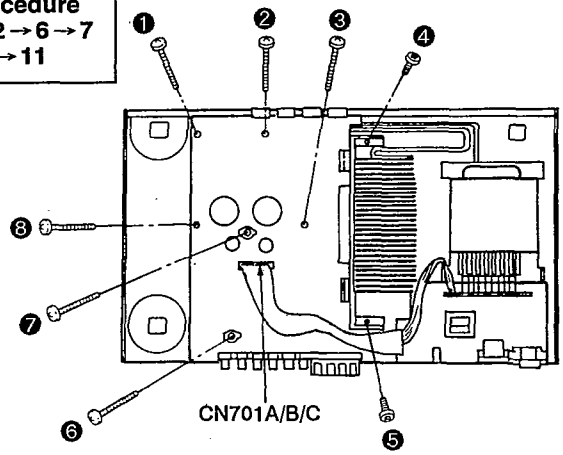
Ref.No. 10	Removal of the main power transformer

Procedure 1→6→8→9→10

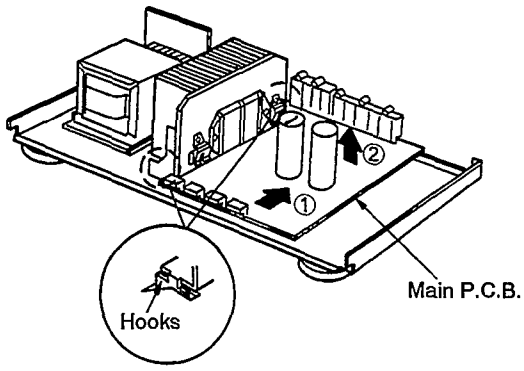


- Remove the 4 screws(❶~❹).

Ref.No. 11	Removal of the main P.C.B.
Procedure 1→2→6→7 →11	

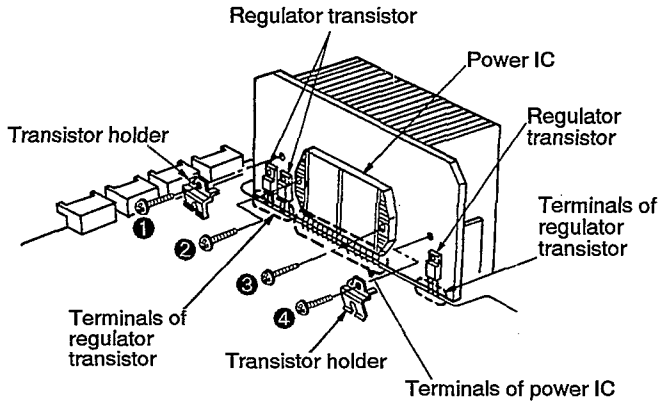


1. Remove the 1 flat cable(CN701A/B/C).
2. Remove the 8 screws(❶~❽).



3. Release the 2 hooks by sliding the main P.C.B. in the direction of arrow ①, and then remove the main P.C.B. in the direction of arrow ②.

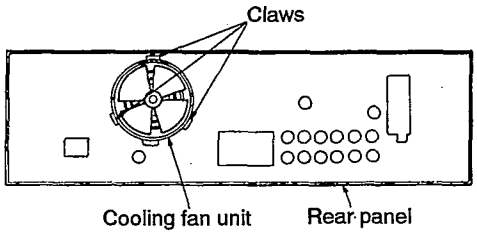
Ref.No. 12	Removal of the power IC and regulator transistor
Procedure 1→2→6→7 →11→12	



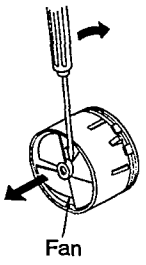
1. Unsolder the terminals of power IC or regulator transistor.
2. Remove the 4 screws(❶~❹).
3. Remove the transistor holder.

- **When mounting the power IC or regulator transistor.** Apply silicone compound(RFKX0002) to the rear side of power IC or regulator transistor.

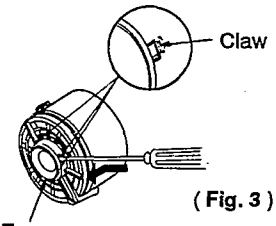
Ref.No. 13	Removal of the cooling fan motor
Procedure 1→6→13	



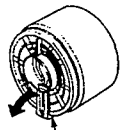
(Fig. 1)



(Fig. 2)

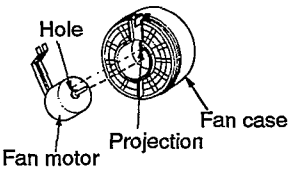


(Fig. 3)

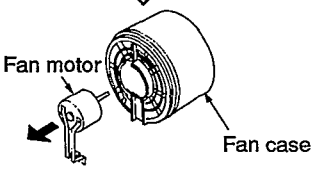


(Fig. 4)

Fan termimal cap



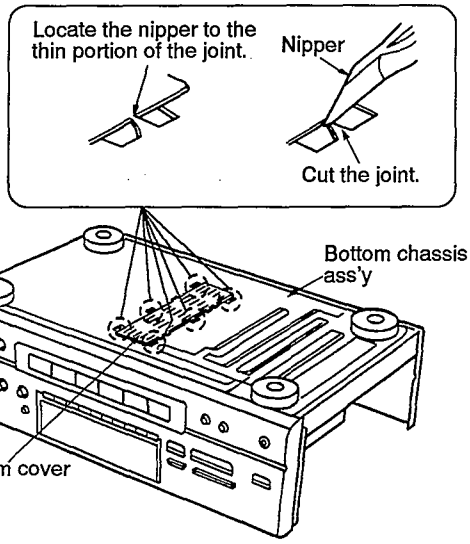
(Fig. 6)



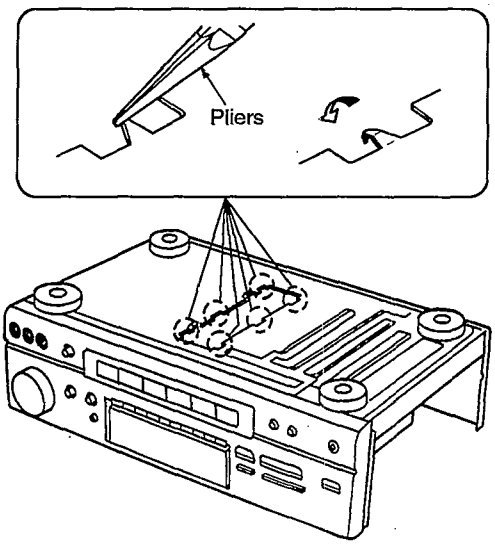
(Fig. 5)

1. Release the 3 claws. (See **Fig. 1**)
2. Insert a screwdriver at the foot of the fan. Force it out of the motor shaft. (See **Fig. 2**)
3. Remove the fan cap by used ⊖ screwdriver. (See **Fig. 3**)
4. Remove the fan terminal cap in the direction of arrow. (See **Fig. 4**)
5. Remove the fan motor from the fan case. (See **Fig. 5**)
6. When mounting the fan motor, align the fan casing's projection with the hole of the fan motor. (See **Fig. 6**)

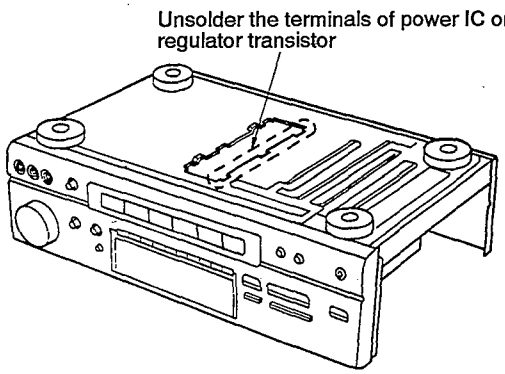
■ HOW TO REPLACEMENT THE POWER IC AND REGULATOR TRANSISTOR



1. Cut the joints(6 portions) between bottom cover and bottom chassis ass'y with nipper.



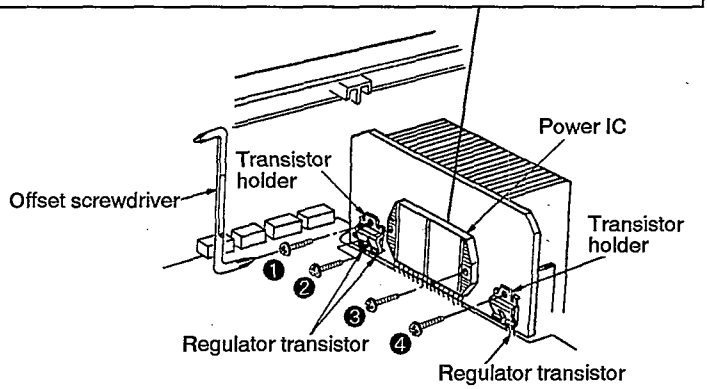
2. After cutting the joints(6 portions), bend the portions of the bottom chassis ass'y in the direction of arrow with pliers.



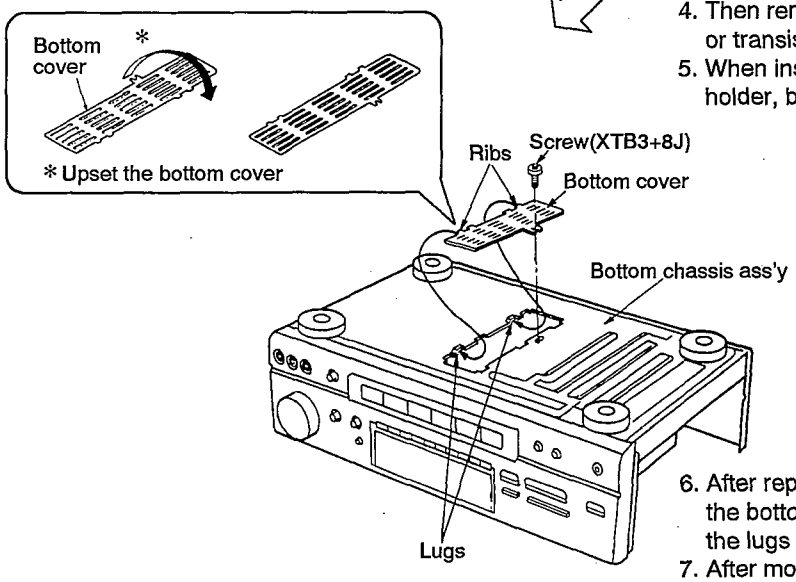
3. When replacing the power IC or regulator transistor, unsolder the terminals of power IC or regulator transistor on the soldered surface.

CAUTION

- After replacing the power IC or regulator transistor, apply a sufficient quantity of compound grease (RFKX0002) between the heat sink and the power IC or regulator transistor. (Radiation of power IC & transistor)
- Tighten enough the screws (❶~❹)after replacing the power IC or regulator transistor. Otherwise, the heat radiation works little.



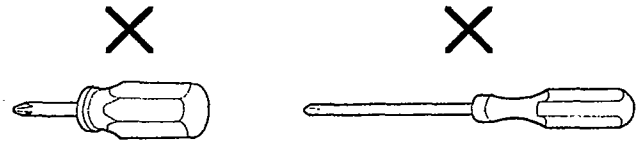
4. Then remove the 4 screws(❶~❹)fixed to the power IC or transistor holder.
5. When installing or removing the power IC or transistor holder, be sure to use an offset screwdriver.



6. After replacing the power IC or regulator transistor, upset the bottom cover and align the ribs of the bottom cover to the lugs on the bottom chassis ass'y.
7. After mounting the bottom cover on the bottom chassis ass'y, fix it with a screw(XTB3+8J).

CAUTION:

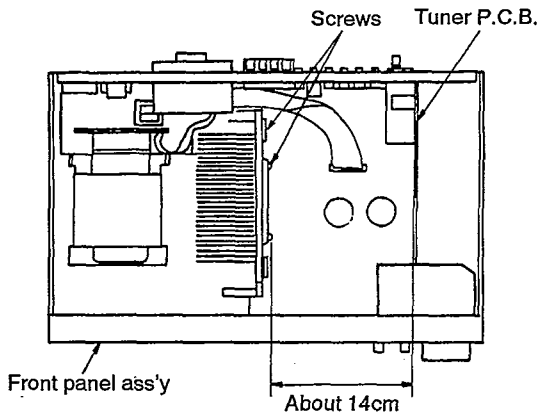
1. A long straight screwdriver cannot be used for removal or mounting since its long grip interferes with the neighboring P.C.B.(See Fig.1)
2. A short straight screwdriver may be used for removal, but cannot be used for mounting because the limited space in the unit will not allow sufficient tightening torque. (See Fig.2)



A short straight screwdriver　　A long straight screwdriver

Fig.2

3. Insufficient tightening will cause poor heat dissipation from the power IC and regulator transistor and, in the worst case, may lead their thermal breakdown. (See Fig.2)

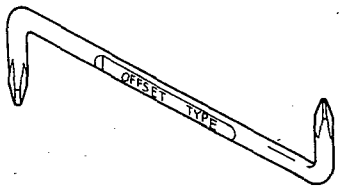


(A long straight screwdriver cannot be used.)

Fig.1

——OFFSET SCREWDRIVER——

•The PROTO offset screwdriver No.34-¼ is recommended for use in the application above.



No.	⊕	← L →
34¼	1 & 2	4¾″

•The address of PROTO International Sales is as follows.

PROTO®

Internatiotal Sales

International Sales Office
Stanley-Proto Industrial Tools
14117 Industrial Park Blvd.
Covington, GA 30209 U.S.A.
Fax: 706-786-4387
Phone: 706-787-3800

Australia, New Zealand & South Pacific
Stanley-Proto Industrial Tools
P.O.Box 10
400 Whitehorse Road
Nunrweding 3131
Victoria, Australia
Fax: 61-3-894-1173
Phone: 61-3-878-9244

Singapore, Indonesia, Philippines, Korea, Hong Kong, Malaysia, China.
Stanley-Proto Asia Pacific
12 Gul Drive
Singapore 2262
Fax: 65-861-3206
Phone: 65-862-0883

Thailand
Stanley-Proto Thailand Ltd.
1017 Moo 13 Bangnatrad Highway, Tambol Bankaew
Amphur Bangplee
Samutprakarn, Thailand
Fax: 66-2-316-6071
Phone: 66-2-316-8655

Japan
Stanley Works Japan
2-7-16 Hyakunin-Cho
Shinjuku-ku
Tokyo 160 Japan
Fax: 81-3-3360-8456
Phone: 81-3-3360-8458

Mexico
Herramientas Stanley S.A. DE C.V.
Apartado Postal 675
72030 Puebla, Pue, Mexico
Fax: 52-22-494-4880
Phone: 52-22-495-300

South & Central America, Puerto Rico, The Caribbian
Stanley Inter-America
2101 N.W. 84th Ave.
Miami, Florida 33122
Fax: 305-594-4261
Phone: 305-591-3828

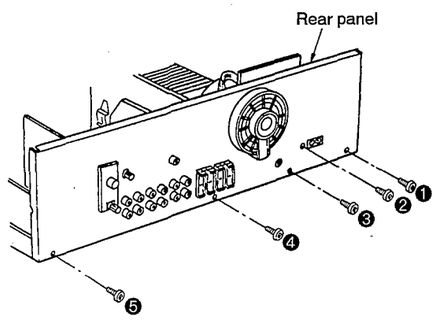
Europe
Stanley-Proto Europe
Woodside, Sheffield
539PD
England
Fax: 44-742-739-038
Phone: 44-742-768-888

Canada
Stanley-Proto Canada
1100 Corporate Drive
Burlington, Ontario
Canada, L7L 5R6
Fax: 416-335-0075
Phone: 416-335-0075

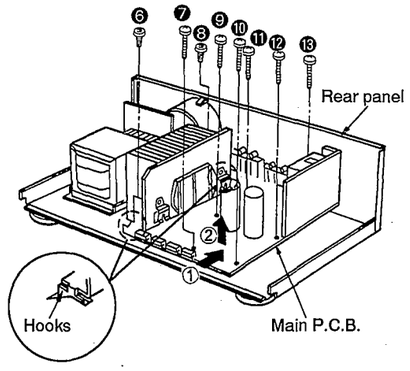
Middle East, Mediterranean & Africa
Stanley-MEMA
Cory House The Rlng
Bracknell Berkshire
RG 12 1A2
England
Fax: 44-344-485-526
Phone: 44-344-51813

■ HOW TO CHECK THE MAIN P.C.B.

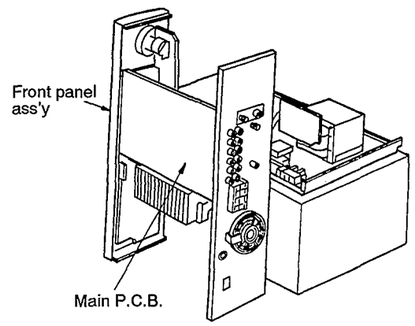
1. Remove the cabinet according to the disassembly instructions, procedure 1 " Removal of the cabinet " on page 8.
2. Remove the front panel ass'y according to the disassembly instructions, procedure 2 " Removal of the front panel ass'y " on page 8.



3. Remove the 5 screws(❶~❺).



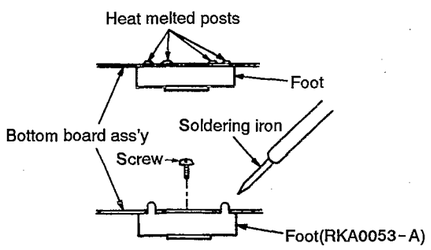
4. Remove the 8 screws(❻~⓭).
5. Release the 2 hooks by sliding the main P.C.B. in the direction of arrow①, and then remove the main P.C.B. equipped with rear panel in the direction of arrow②.



6. Reinstall the front panel ass'y to the main P.C.B.
7. When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown in above.

■ REPLACEMENT OF THE FOOT

1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom board ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



■ TERMINAL FUNCTION OF IC

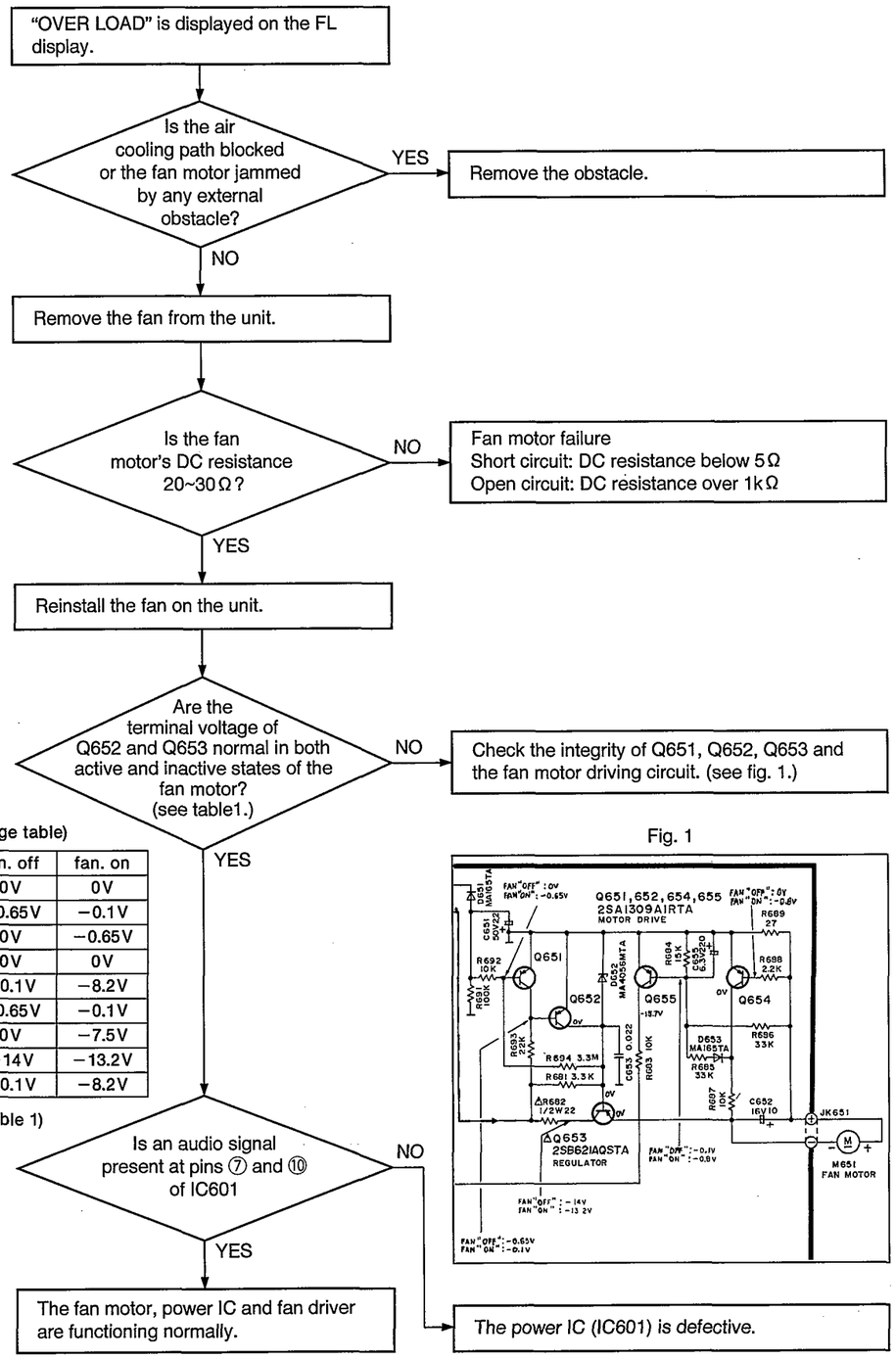
• IC901 (LC8A012C5481) [E, EB, EG, EP], (LC8A012C5470) [G, GN]: Microcomputer

Pin No.	Mark	I/O Division	Function
1 • 2	SPA • SPB	O	Speaker select control terminal
3	ST5	O	Level shift control terminal
4	RFM	—	Not used, open
5	RLY	O	Relay control terminal
6	AFM	O	Muting control terminal
7	−20	O	Muting control (−20dB) terminal
8 ~ 15	DG1 ~ DG8	O	Digit signal of FL display
16	S13	O	Segment signal of FL display
17	VDD	I	Power supply terminal
18	VPP	I	Power supply terminal of FL display
19 ~ 30	S12 ~ S1	O	Segment signal of FL display
31 • 32	FWD • REV	O	Rotation control terminal of volume motor
33	INI	—	Not used, connected to resistor
34	FMST	I	Stereo signal detect terminal
35	SD	I	Received signal detect terminal
36	IFDAIN	I	Serial data signal
37	LOUD	—	Not used, open
38	ST3	O	Level shift control terminal
39	V2	O	Video selector control terminal
40	CE	O	Chip enable terminal

Pin No.	Mark	I/O Division	Function
41	DATA1	O	Serial data signal
42	OVER LOAD	I	Over load detect terminal
43	CK1	O	Serial clock signal
44	DATA2	O	Serial data signal
45	ST2	O	Level shift control terminal
46	CK2	O	Serial clock signal
47	5−6	O	Remote control terminal
48	ST4	O	Level shift control terminal
49	TEST1	—	Test terminal
50	RES	I	Reset detect terminal
51	XT1	—	Not used, connected to power supply
52	XT2	—	Not used, open
53	VSS	—	GND terminal
54	CF1	I	Crystal oscillator
55	CF2	O	Terminal (6MHz)
56	VDD	I	Power supply terminal
57 ~ 60	KEY1 ~ KEY4	I	Key matrix detect terminal
61	STANDBY	O	Power detect terminal
62 • 63	ENCODE A • ENCODE B	I	Not used, connected to power supply
64	REM	I	Remote control terminal

■ FAN MOTOR TROUBLESHOOTING GUIDE

The Model SA-GX170 employ fan motor error sensing electronics.
If the cooling fan is not operation and "OVER LOAD" is displayed on the FL display, check the fan motor and its driving circuit.


"OVER LOAD" is displayed on the FL display.
Is the air cooling path blocked or the fan motor jammed by any external obstacle?
YES
Remove the obstacle.
NO
Remove the fan from the unit.
Is the fan motor's DC resistance 20~30Ω?
NO
Fan motor failure
Short circuit: DC resistance below 5Ω
Open circuit: DC resistance over 1kΩ
YES
Reinstall the fan on the unit.
Are the terminal voltage of Q652 and Q653 normal in both active and inactive states of the fan motor? (see table1.)
NO
Check the integrity of Q651, Q652, Q653 and the fan motor driving circuit. (see fig. 1.)
YES
Is an audio signal present at pins ⑦ and ⑩ of IC601
NO
YES
The fan motor, power IC and fan driver are functioning normally.
The power IC (IC601) is defective.

(Voltage table)

		fan. off	fan. on
Q651	E	0V	0V
	C	−0.65V	−0.1V
	B	0V	−0.65V
Q652	E	0V	0V
	C	−0.1V	−8.2V
	B	−0.65V	−0.1V
Q653	E	0V	−7.5V
	C	−14V	−13.2V
	B	−0.1V	−8.2V

(Table 1)

Fig. 1

■ SCHEMATIC DIAGRAM (Parts list on pages 38~43.)

(This schematic diagram may be modified at any time with the development of new technology.)

Notes 1:

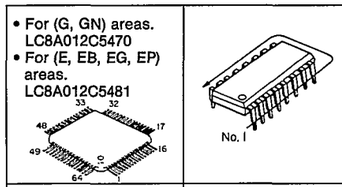
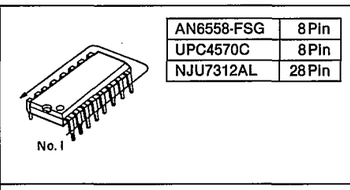
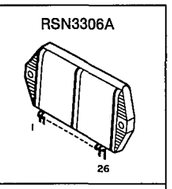
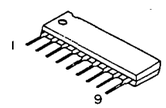
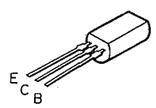
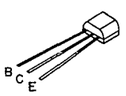
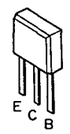
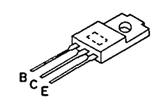
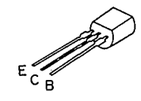
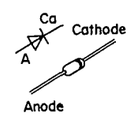
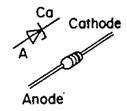
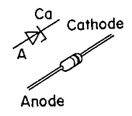
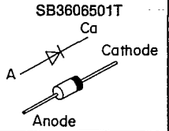
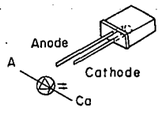
- Signal line
  - : FM OSC
  - : AM (MW/LW) OSC
  - : FM signal
  - : AM (MW/LW) signal
  - : Rec out signal (Lch)
  - : AF signal (Lch)
  - : Positive voltage lines
  - : Negative voltage lines
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.
- ＊Figures in ( ) Stand for DC-voltage in AM (MW) signal reception mode.
- ＊Figures in 〈 〉Stand for DC-voltage in LW signal reception mode.

＊ **Caution!**

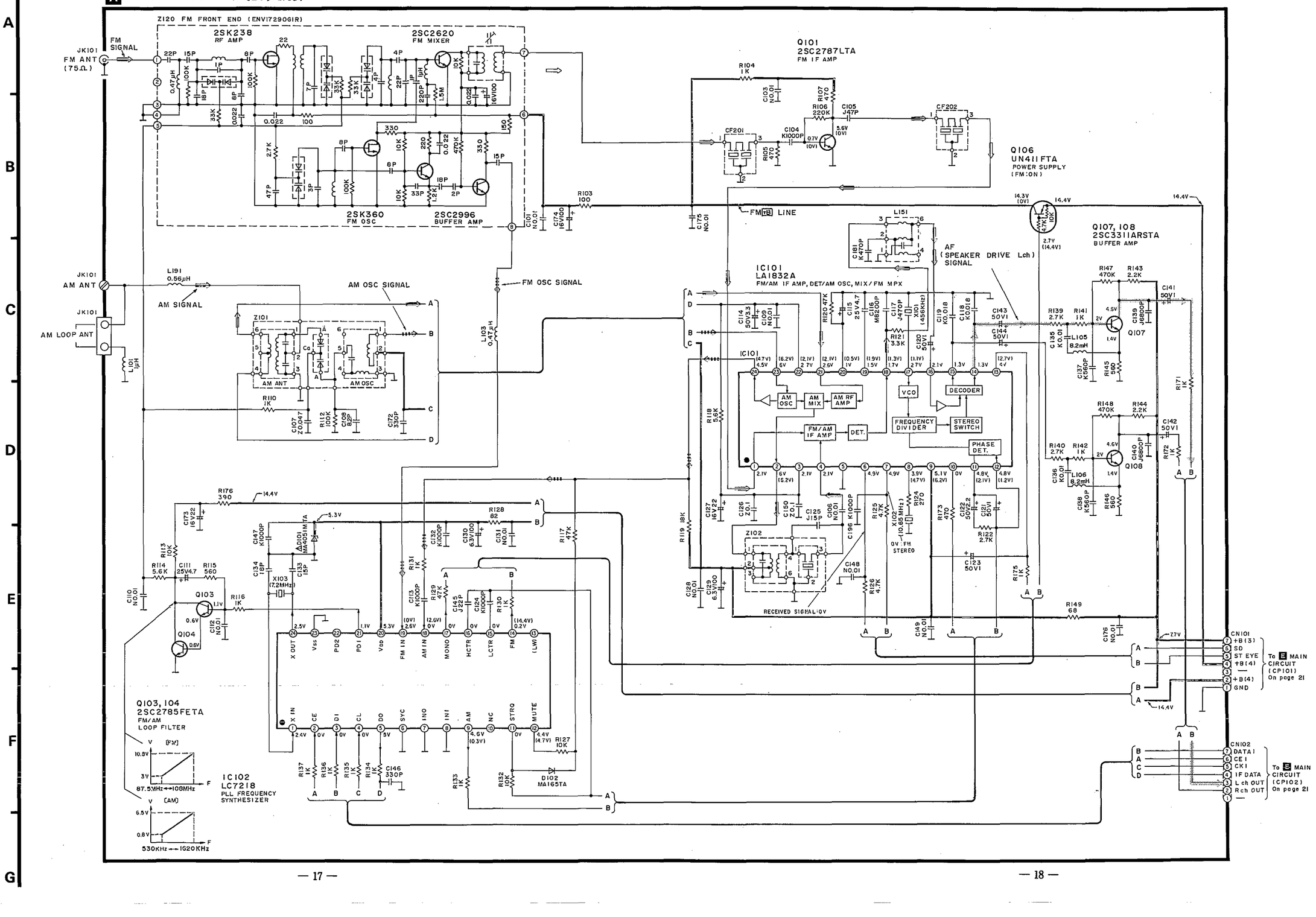
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

＊ Cover the parts boxes made of plastics with alminum foil.
＊ Ground the soldering iron.
＊ Put a conductive mat on the work table.
＊ Do not touch the legs of IC or LSI with the fingers directly.

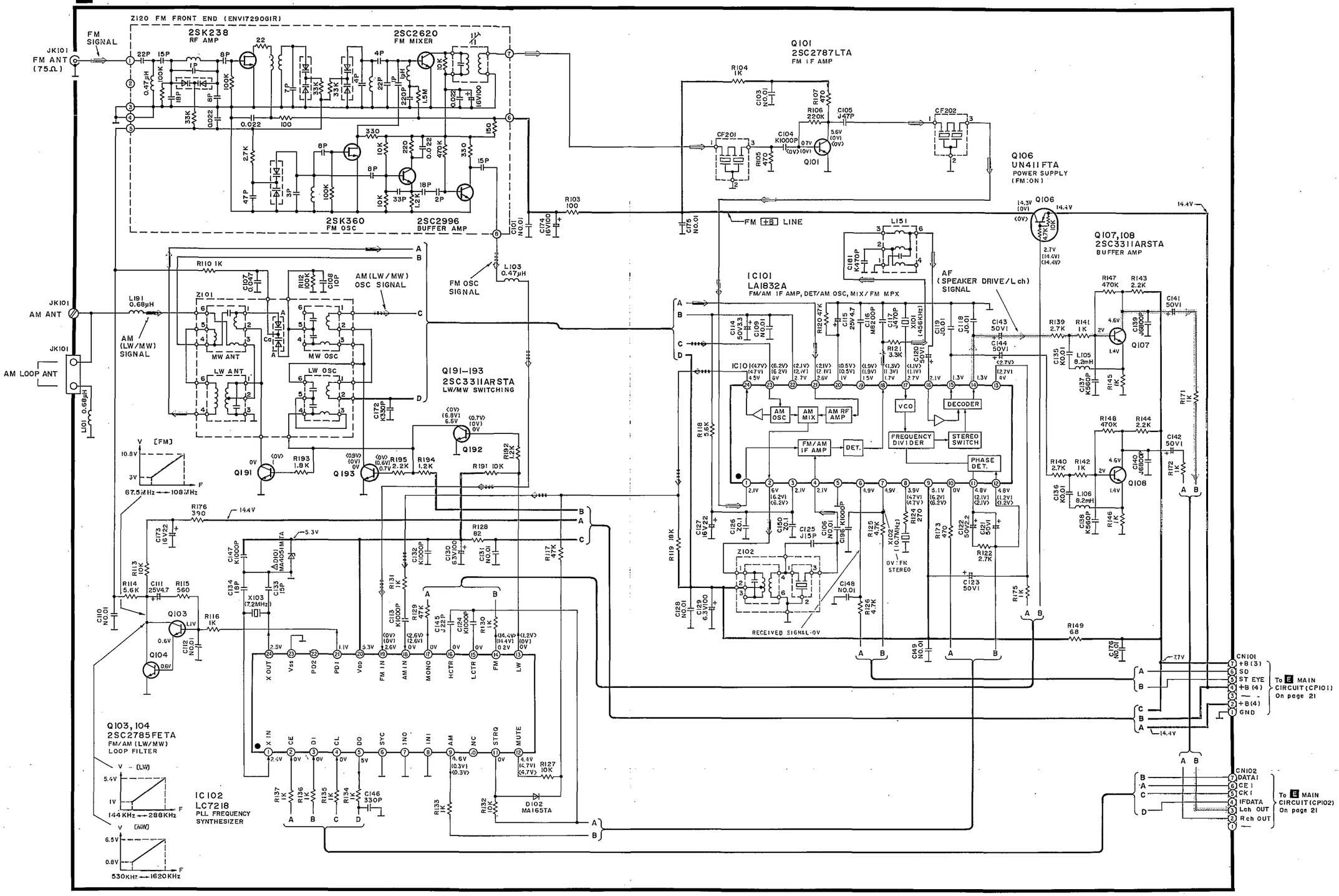
• Terminal guide of IC's, transistors and diodes

• For (G, GN) areas. LC8A012C5470 • For (E, EB, EG, EP) areas. LC8A012C5481		M5218AP 8Pin LA1832A 24Pin LC7218 24Pin	 AN6558-FSG 8Pin UPC4570C 8Pin NJU7312AL 28Pin	 RSN3306A
BA6218 	2SC3940AQSTA 	2SC3327ABTP 	 2SA1309AIRTA 2SC2785FETA 2SC2787LTA 2SC3311AIRTA 2SC3311ARSTA UN411FTA UN4113TA	UN421FTA UN4214TA
2SB1187DEF 2SD1761DEF 	2SB621AQSTA 	 MA165TA MA700ATA 1SS291TA 1SR35200TB		MA4039MTA MA4051MTA MA4056MTA MA4062MTA MA4068MTA MA4075MTA
MA4160MTA MA4220MTA 	P300DLF P300D5002T SB3606501T 	LN846RPH 		

A TUNER CIRCUIT For [EG] area.



A TUNER CIRCUIT For [E,EB,EP,G,GN] areas.



11 12 13 14 15 16 17 18 19 20 21 22 23 24

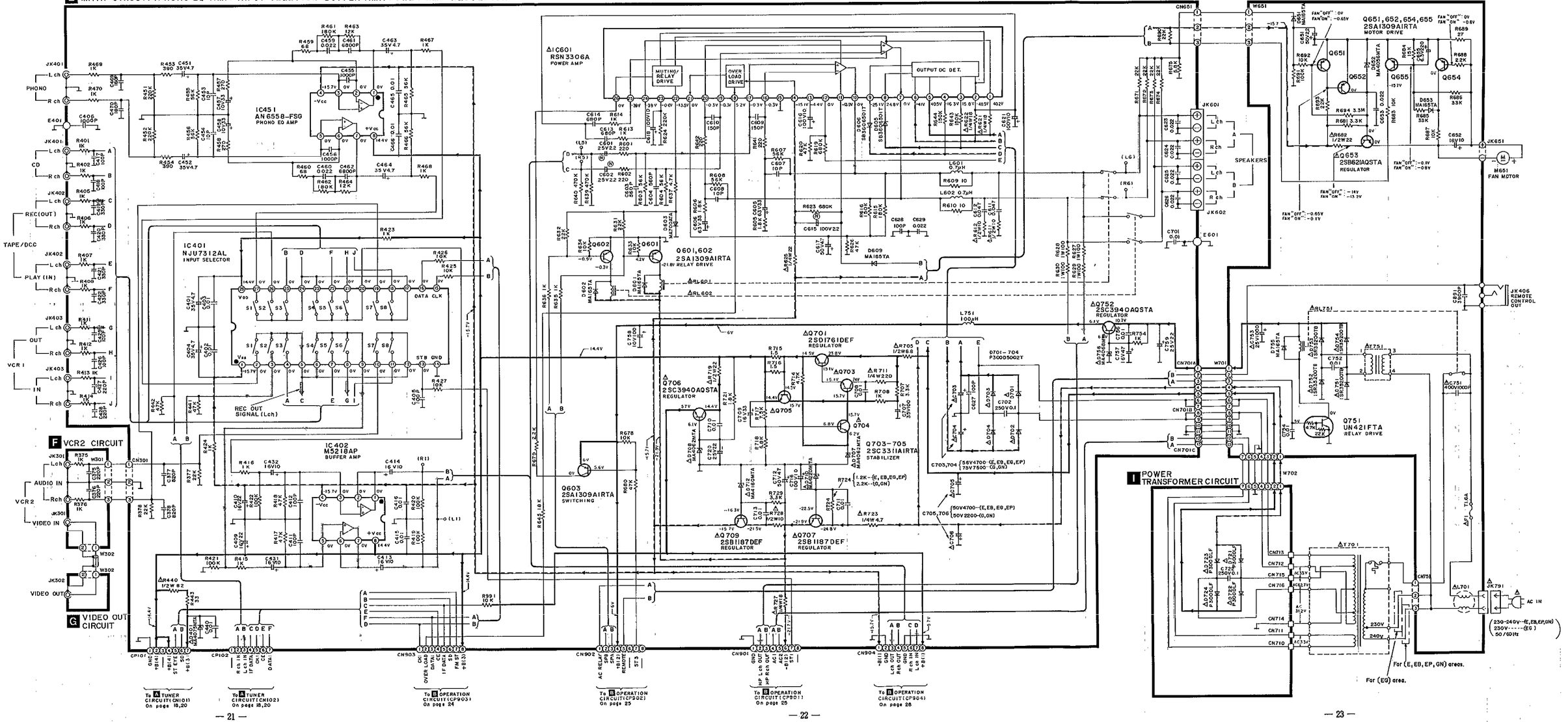
E MAIN CIRCUIT (PHONO EQ AMP/ INPUT SELECTOR/ BUFFER AMP/ POWER AMP/ REGULATOR

H POWER SUPPLY CIRCUIT

F VCR2 CIRCUIT

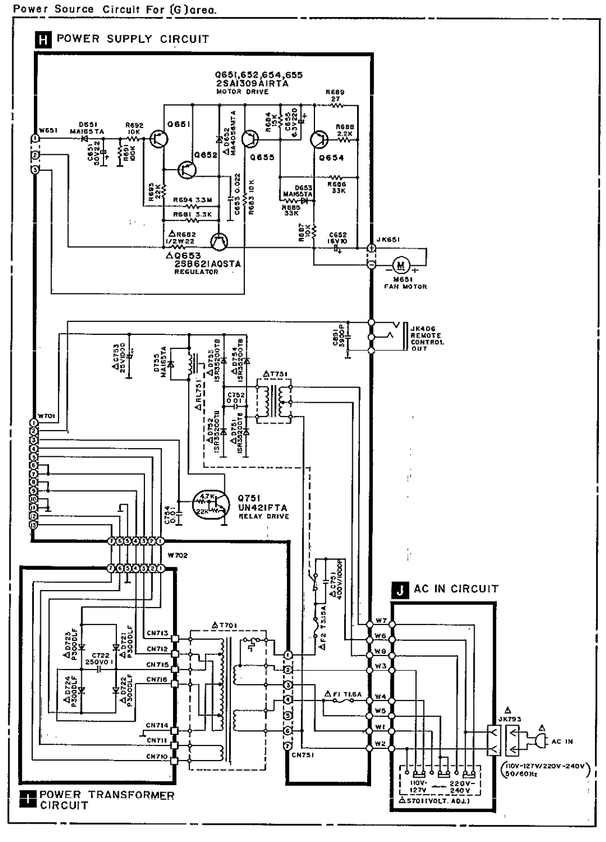
G VIDEO OUT CIRCUIT

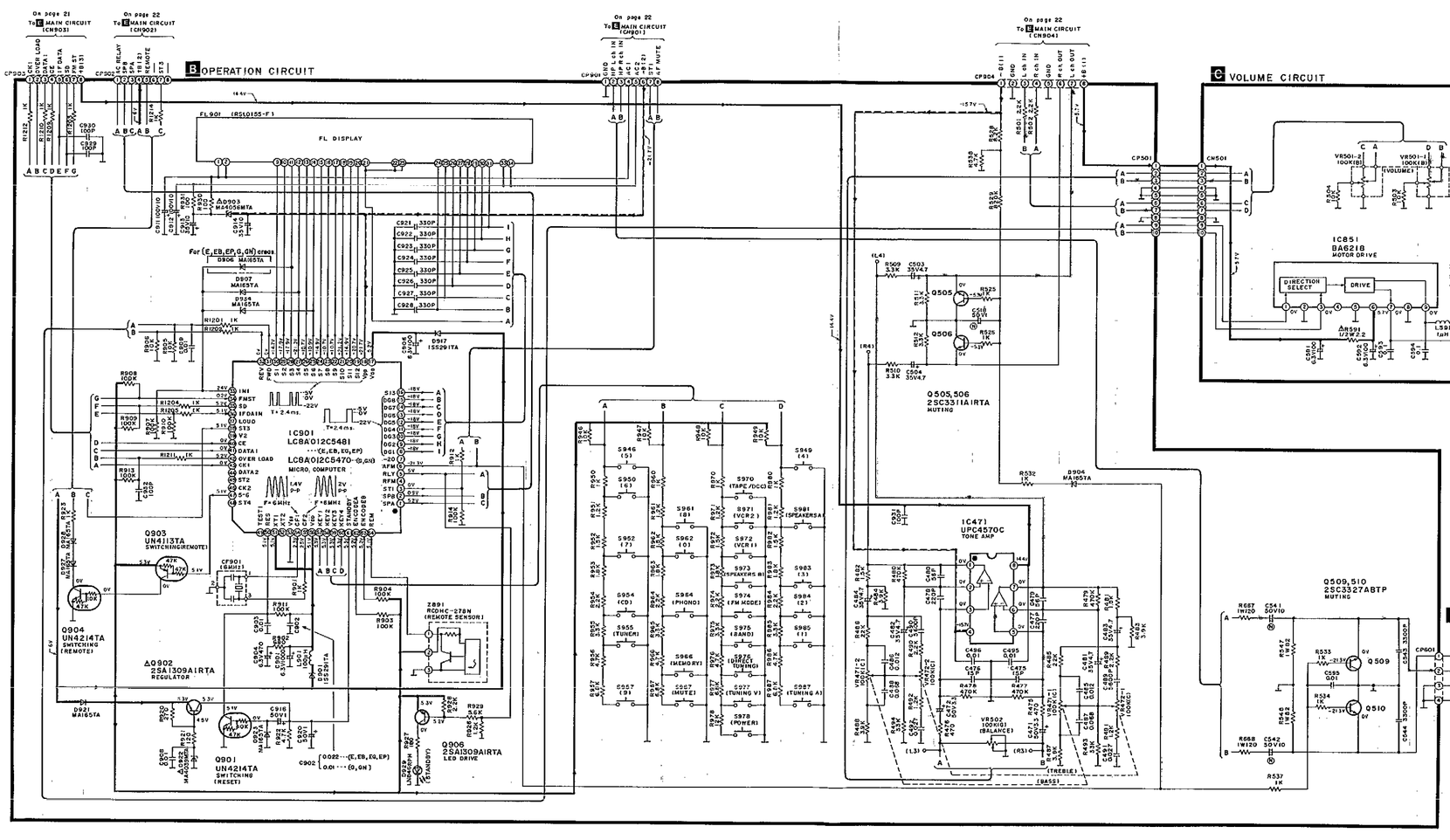
I POWER TRANSFORMER CIRCUIT



SA-GX170 SA-GX170

Power Source Circuit For (G)area.





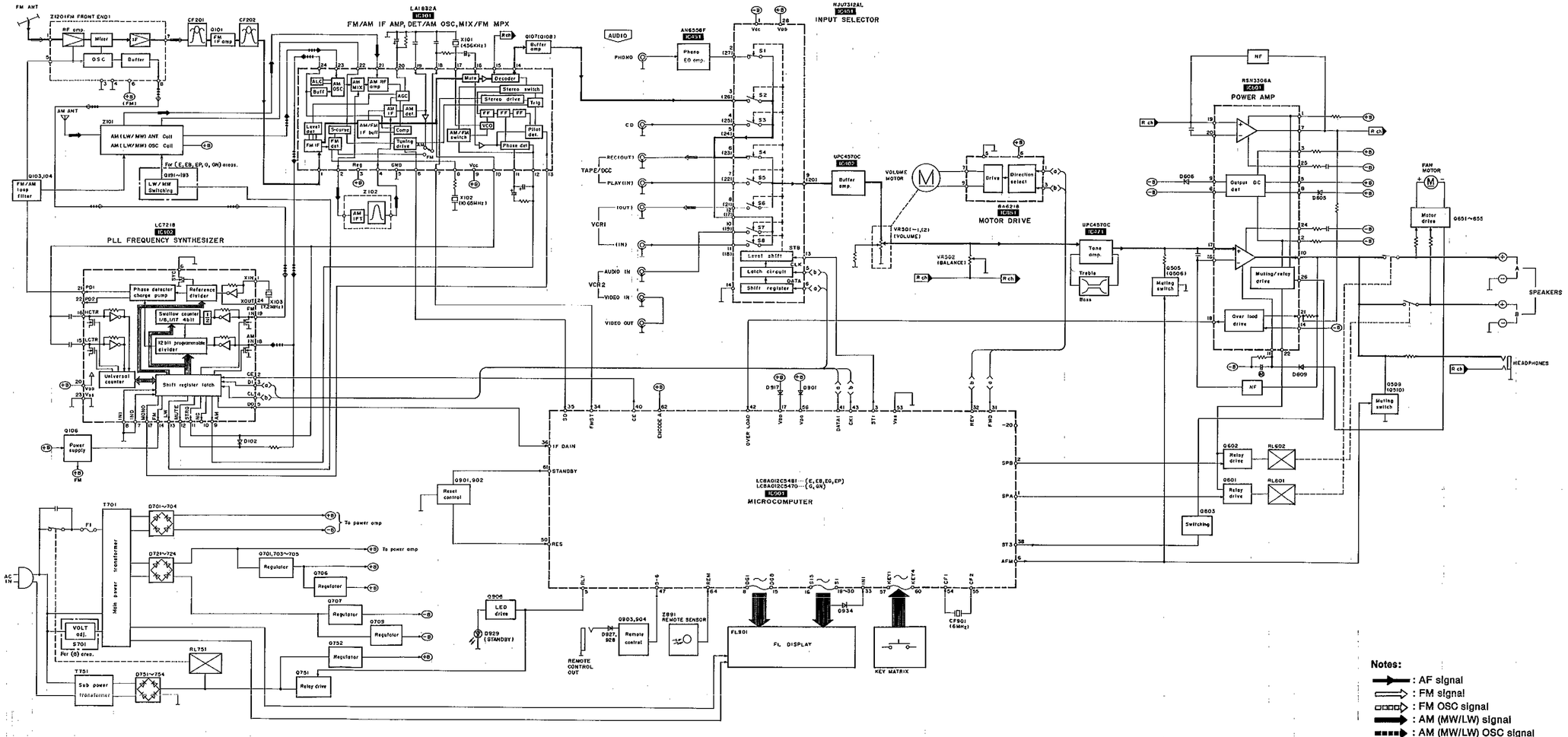
Notes 2:

- **S701** : Voltage adjustment switch in "240V" position. (110V ↔ 127V ↔ 220V ↔ 240V) (For (G) area only.)
- **S946** : Numeric (5) switch.
- **S949** : Numeric (4) switch.
- **S950** : Numeric (6) switch.
- **S952** : Numeric (7) switch.
- **S954, 955** : Input select switches. (S954: CD, S955: TUNER)
- **S957** : Numeric (9) switch.
- **S961** : Numeric (8) switch.
- **S962** : Numeric (0) switch.
- **S964** : Input select (PHONO) switch.
- **S966** : Memory (MEMORY) switch.
- **S967** : Muting (MUTING) switch.
- **S970** : Tape/DCC monitor (TAPE/DCC MONITOR) switch.
- **S971, 972** : Input select switchs. (S971: VCR2, S972: VCR1)
- **S973** : Speaker select (SPEAKERS B) switch.
- **S974** : FM mode select (FM MODE) switch.
- **S975** : Band select (BAND) switch.
- **S976** : Direct tuning (DIRECT TUNING) switch.
- **S977** : Tuning (TUNING ∨) switch.
- **S978** : Power "STANDBY ⏻ /ON" (POWER, STANDBY ⏻ /ON) switch.
- **S981** : Speaker select (SPEAKERS A) switch.
- **S983** : Numeric (3) switch.
- **S984** : Numeric (2) switch.
- **S985** : Numeric (1) switch.
- **S987** : Tuning (TUNING ∧) switch.
- Signal line
  - : FM OSC
  - : AM (MW/LW) OSC
  - : FM signal
  - : AM (MW/LW) signal
  - : Rec out signal (Lch)
  - : AF signal (Lch)
  - : Positive voltage lines
  - : Negative voltage lines
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.

*Figures in ( ) Stand for DC-voltage in AM (MW) signal reception mode.

*Figures in 〈 〉 Stand for DC-voltage in LW signal reception mode.

■ BLOCK DIAGRAM



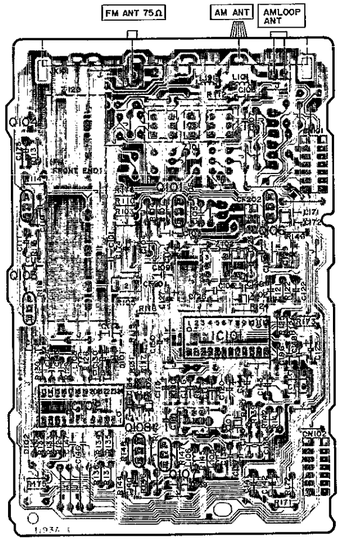
Notes:

- : AF signal
- : FM signal
- : FM OSC signal
- : AM (MW/LW) signal
- : AM (MW/LW) OSC signal
- : Rec out signal

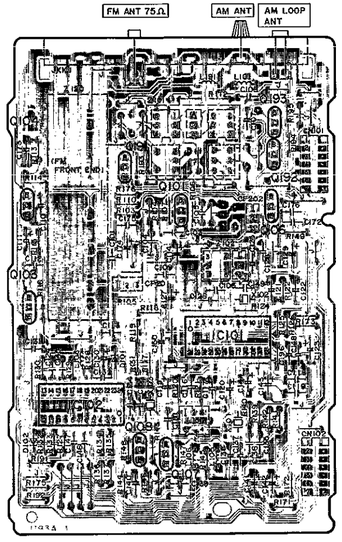
*( ) indicates Pin No. of right channel.

■PRINTED CIRCUIT BOARDS

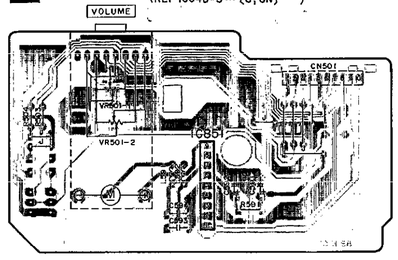
A TUNER P.C.B. For (EG) area.
(REPI750C-T)



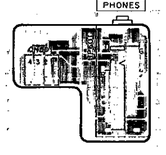
A TUNER P.C.B. For (E, EB, EP, G, GN) areas.
(REPI750B-T)



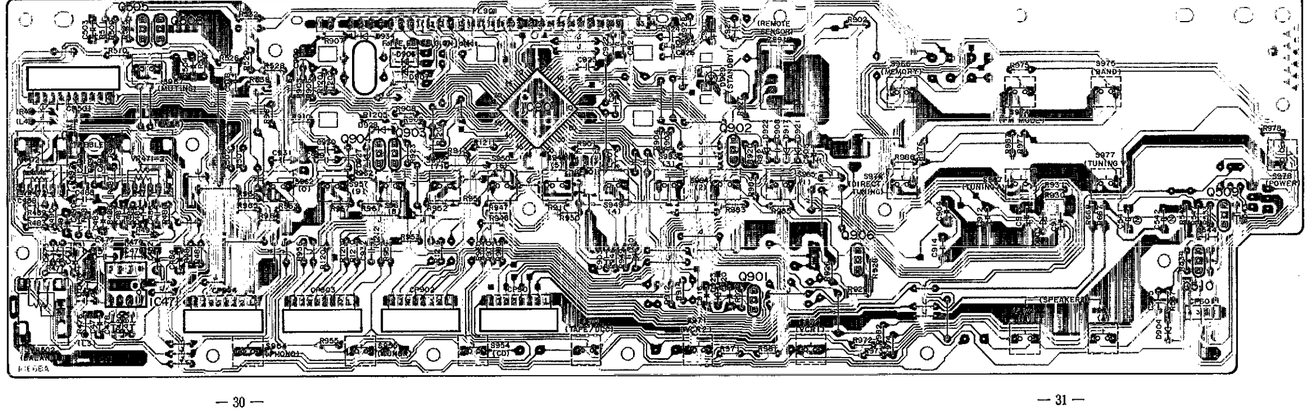
C VOLUME P.C.B. (REPI604B-S··· (E, EB, EP) / REPI604C-S··· (EG) / REPI604D-S··· (G, GN))



D HEADPHONES JACK P.C.B.
(REPI604B-S··· (E, EB, EP) / REPI604C-S··· (EG) / REPI604D-S··· (G, GN))



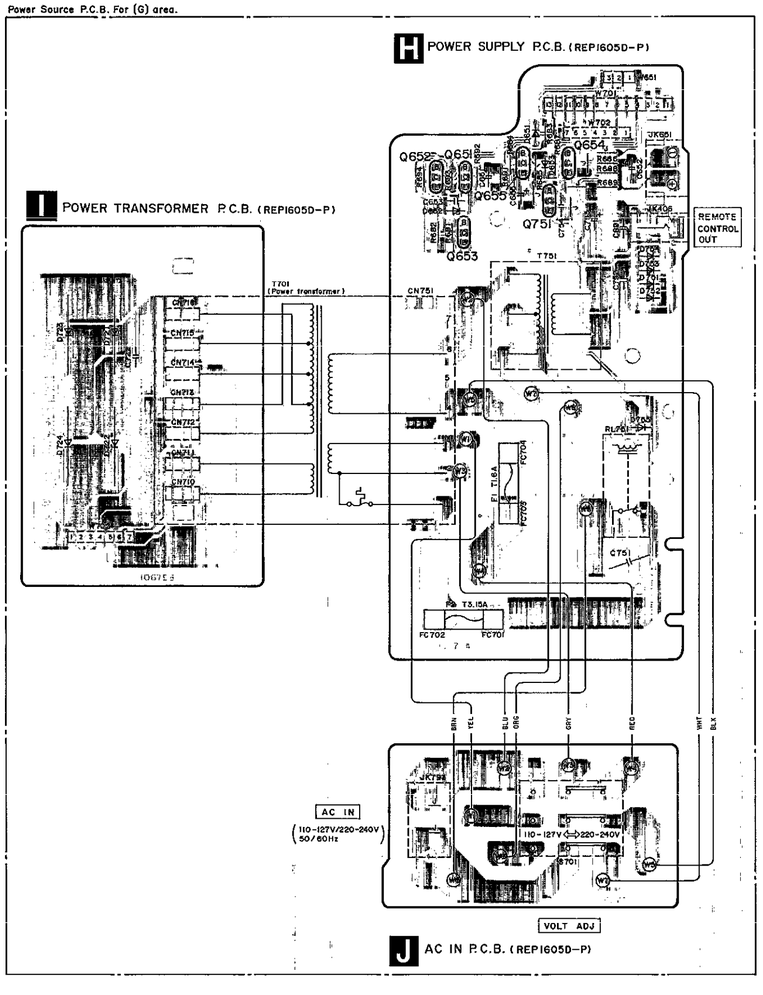
B OPERATION P.C.B. (REPI604B-S··· (E, EB, EP) / REPI604C-S··· (EG) / REPI604D-S··· (G, GN))



Power Source P.C.B. For (G) area.

H POWER SUPPLY P.C.B. (REPI605D-P)

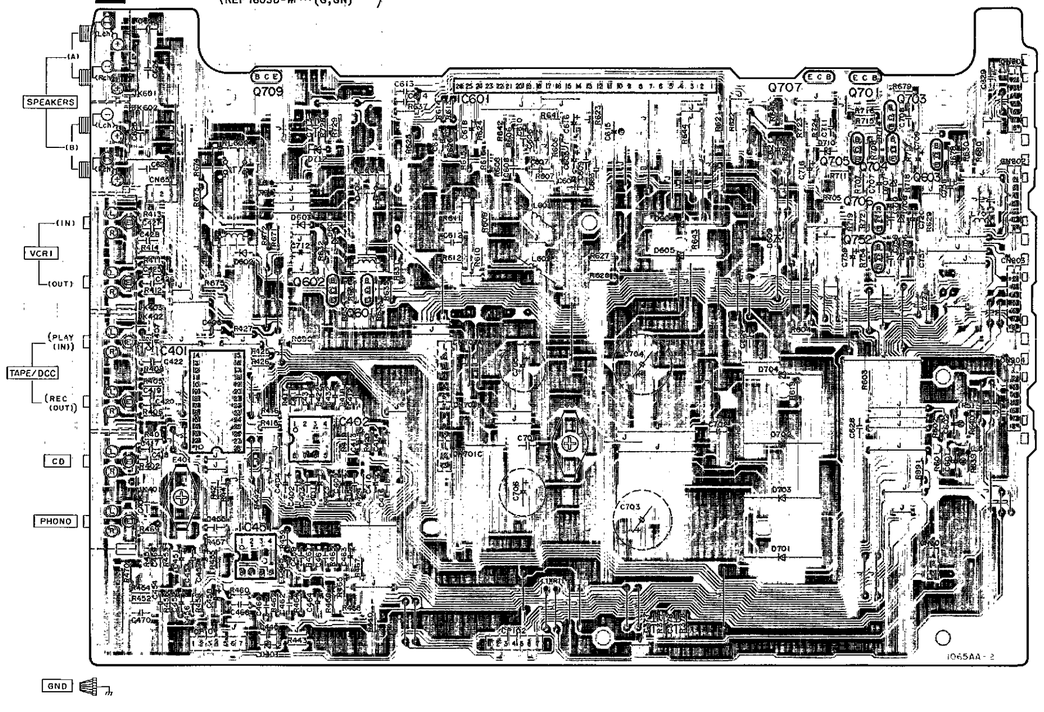
I POWER TRANSFORMER P.C.B. (REPI605D-P)



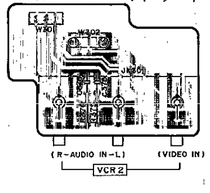
J AC IN P.C.B. (REPI605D-P)

15 16 17 18 19 20 21 22 23 24

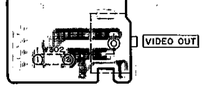
E MAIN P.C.B. (REP1603B-M ··· (E,EB,EP) / REP1603C-M ··· (EG) / REP1603D-M ··· (G,GN))



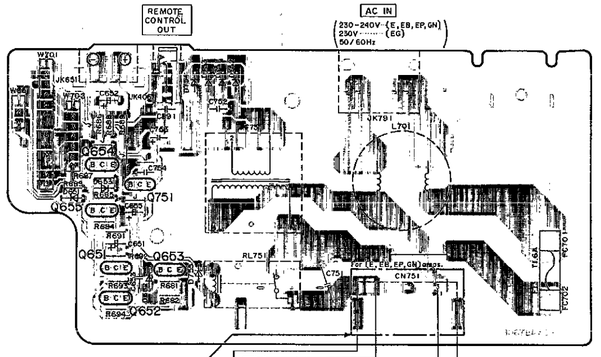
F VCR 2 P.C.B. (REP1604B-S ··· (E,EB,EP) / REP1604C-S ··· (EG) / REP1604D-S ··· (G,GN))



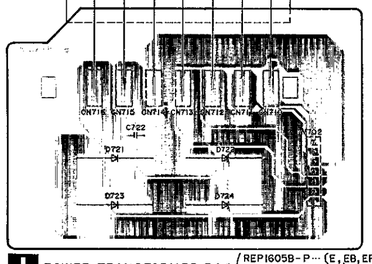
G VIDEO OUT P.C.B. (REP1604B-S ··· (E,EB,EP) / REP1604C-S ··· (EG) / REP1604D-S ··· (G,GN))



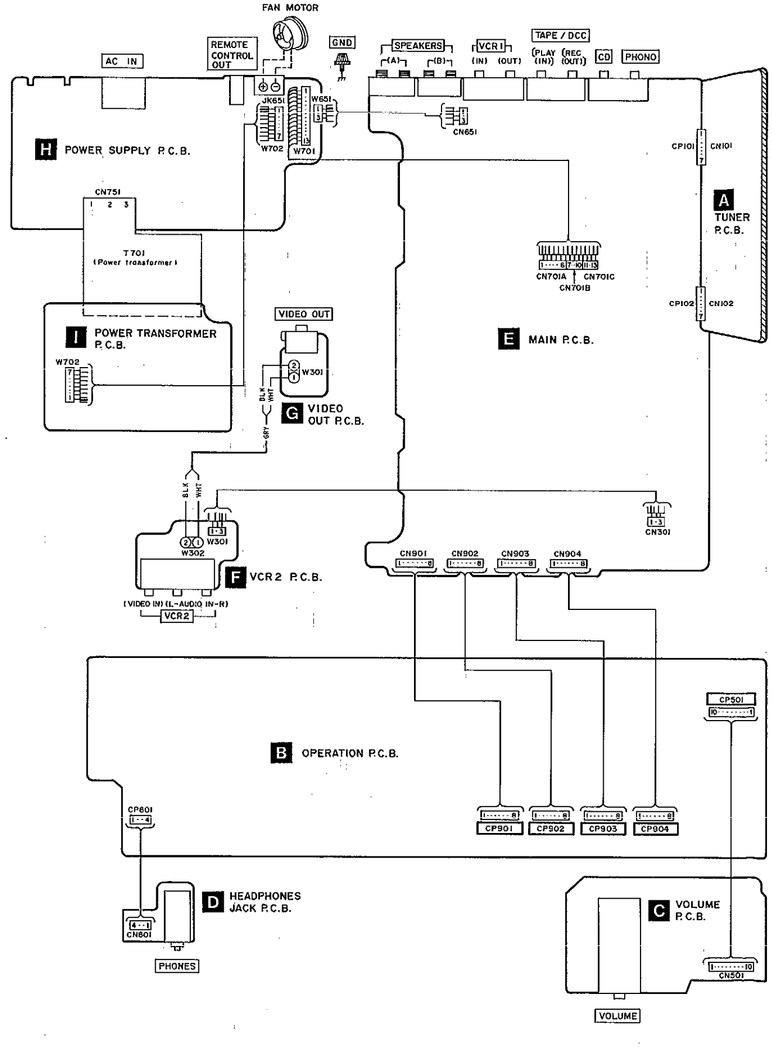
H POWER SUPPLY P.C.B. (REP1605B-P ··· (E,EB,EP) / REP1605C-P ··· (EG) / REP1605E-P ··· (GN))



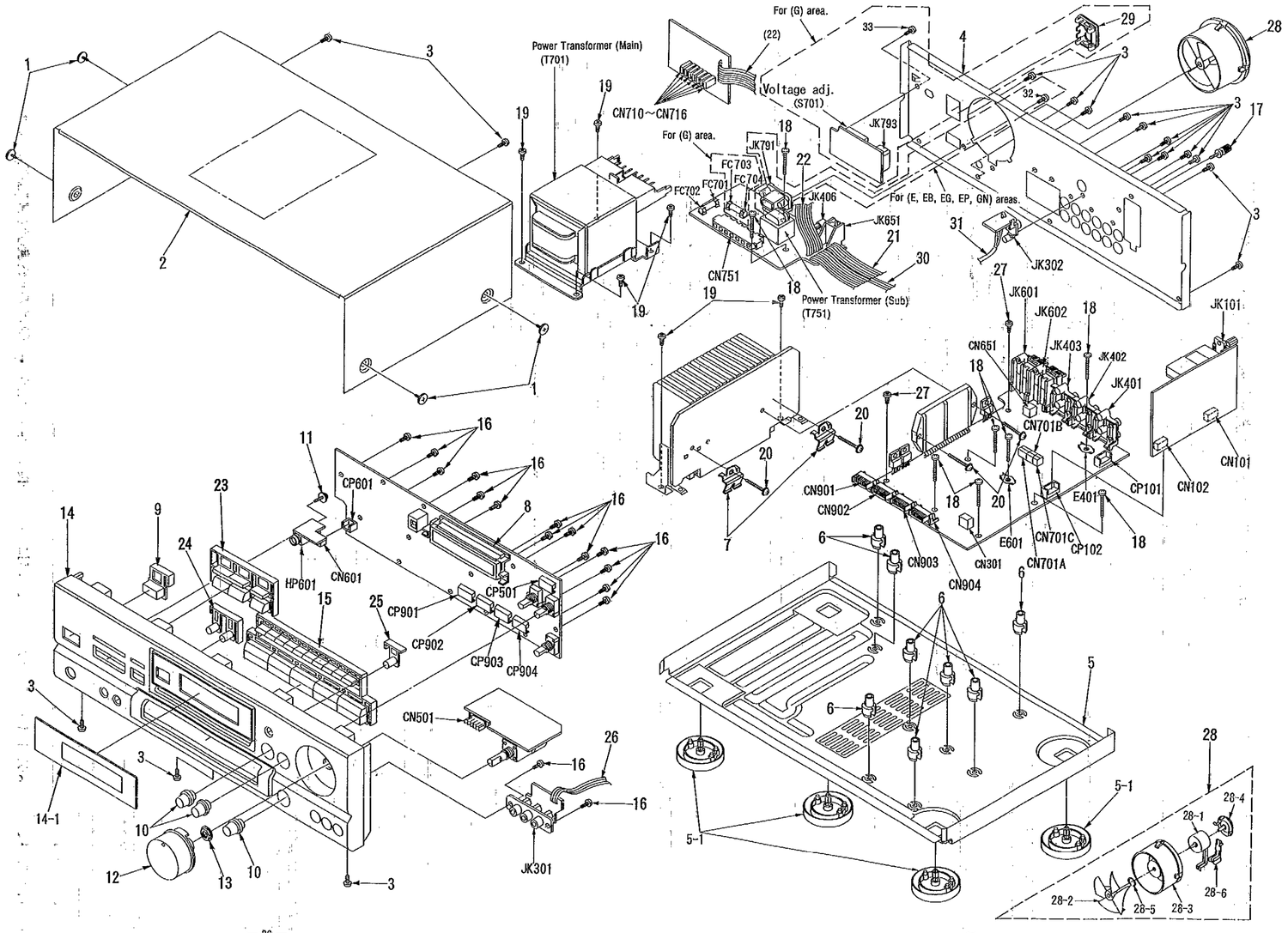
I POWER TRANSFORMER P.C.B. (REP1605B-P ··· (E,EB,EP) / REP1605C-P ··· (EG) / REP1605E-P ··· (GN))



WIRING CONNECTION DIAGRAM



■ CABINET PARTS LOCATION



■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RHD30035-K1	SCREW	
2	RGM0260B-K	CABINET	
3	XTBS3+8JFZ1	SCREW	
4	RGR0178B-B	REAR PANEL	(E, EP)
4	RGR0178B-C1	REAR PANEL	(EB)
4	RGR0178B-A1	REAR PANEL	(EG)
4	RGR0178C-A1	REAR PANEL	(G)
4	RGR0178B-D	REAR PANEL	(GN)
5	RFKJAGX170PK	BOTTOM CHASSIS ASS'Y	
5-1	RKA0053-A	FOOT	
6	RMQ0089	P.C.B. SUPPORT	
7	RMC0158	TRANSISTOR HOLDER	
8	RMN0248-1	FL HOLDER	
9	RFKNAGX170AK	POWER BUTTON ASS'Y	
10	RGW0198-K	BALANCE/TREBLE/BASS KNOB	
11	RHD26016	SCREW	
12	RGW0145-1K	VOLUME KNOB	
13	RHN90001	NUT	
14	RFKGAGX170E	FRONT PANEL ASS'Y	(E, EB, EG, EP)
14	RFKGAGX170G	FRONT PANEL ASS'Y	(G, GN)
14-1	RKW0317A-Q	TRANSPARENT PLATE	
15	RGU1057-K	SELECTOR BUTTON	
16	XTBS26+8J	SCREW	
17	SNE2123	GND TERMINAL	
18	XTB3+20JFZ	SCREW	
19	XTB3+8JFZ	SCREW	
20	XTW3+15T	SCREW	
21	RWJ1813300QK	FLAT CABLE(13P) (W701)	
22	RWJ1807180KK	FLAT CABLE(7P) (W702)	
23	RFKNAGX170BK	MODE BUTTON ASS'Y	
24	RFKNAGX170CK	SPEAKER BUTTON ASS'Y	
25	RFKNAGX170DK	MUTING BUTTON ASS'Y	
26	RWJ1803150QK	FLAT CABLE(3P) (W301)	
27	XTW3+8T	SCREW	
28	REM0020-1	COOLING FAN UNIT	
28-1	MDN-4RB4MRC	FAN MOTOR	
28-2	SNE232-1	FAN	
28-3	RMQ0209-K	FAN CASE	
28-4	RMQ0208-K	FAN CAP	
28-5	SUS271	SPRING	
28-6	RMQ0212-K	FAN TERMINAL CAP	
29	SJS9231A	AC INLET COVER	(G)
30	RE20682	FLAT CABLE(3P) (W651)	

Ref. No.	Part No.	Part Name & Description	Remarks
31	RFKEAGX170EK	CONNECTOR ASS'Y(3P) (W302)	
32	XTBS3+8JFZ1	SCREW	(E, EB, EG, EP, GN)
33	XTBS3+8JFZ1	SCREW	(G)
		INTEGRATED CIRCUIT(S)	
IC101	LA1832A	FM/AM IF AMP./AM OSC	
IC102	LC7218	PLL FREQ SYNTHESIZER	
IC401	NJU7312AL	INPUT SELECTOR	
IC402	M5218AP	BUFFER AMP	
IC451	AN6558-FSG	PHONO EQ AMP	
IC471	UPC4570C	TONE CONTROL	
IC601	RSN3306A	POWER AMP	⚠
IC851	BA6218	MOTOR DRIVE	
IC901	LC8A012C5481	MICROCOMPUTER	(E, EB, EG, EP)
IC901	LC8A012C5470	MICROCOMPUTER	(G, GN)
		TRANSISTOR(S)	
Q101	2SC2787L	TRANSISTOR	
Q103, 104	2SC2785FE	TRANSISTOR	
Q106	UN411FTA	TRANSISTOR	
Q107, 108	2SC3311ARSTA	TRANSISTOR	
Q191-193	2SC3311ARSTA	TRANSISTOR	(E, EB, EP, G, GN)
Q505, 506	2SC3311AIRTA	TRANSISTOR	
Q509, 510	2SC3327-A	TRANSISTOR	
Q601-603	2SA1309AIRTA	TRANSISTOR	
Q651, 652	2SA1309AIRTA	TRANSISTOR	
Q653	2SB621AQSTA	TRANSISTOR	⚠
Q654, 655	2SA1309AIRTA	TRANSISTOR	
Q701	2SD1761DEF	TRANSISTOR	⚠
Q703-705	2SC3311AIRTA	TRANSISTOR	⚠
Q706	2SC3940AQSTA	TRANSISTOR	⚠
Q707	2SB1187DEF	TRANSISTOR	⚠
Q709	2SB1187DEF	TRANSISTOR	⚠
Q751	UN421FTA	TRANSISTOR	
Q752	2SC3940AQSTA	TRANSISTOR	⚠
Q901	UN4214TA	TRANSISTOR	
Q902	2SA1309AIRTA	TRANSISTOR	⚠
Q903	UN4113TA	TRANSISTOR	
Q904	UN4214TA	TRANSISTOR	
Q906	2SA1309AIRTA	TRANSISTOR	
		DIODE(S)	
D101	MA4051MTA	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA165	DIODE	
D401	MA4075MTA	DIODE	⚠
D601, 602	MA165	DIODE	
D603	MA700	DIODE	
D605, 606	SB3606501T	DIODE	
D609	MA165	DIODE	
D651	MA165	DIODE	
D652	MA4056MTA	DIODE	
D653	MA165	DIODE	
D701-704	P300D5002T	DIODE	⚠
D707, 708	MA4062MTA	DIODE	⚠
D710	MA4220MTA	DIODE	⚠
D712	MA4160M	DIODE	⚠
D721-724	P300DLF	DIODE	⚠
D751-754	1SR35200TB	DIODE	⚠
D755	MA165	DIODE	
D756	MA4068M	DIODE	⚠
D901	1SS291TA	DIODE	
D903	MA4056MTA	DIODE	⚠
D904	MA165	DIODE	
D906	MA165	DIODE	(E, EB, EP, G, GN)
D907	MA165	DIODE	
D917	1SS291TA	DIODE	
D921	MA165	DIODE	
D922	MA4039MTA	DIODE	⚠
D923	MA165	DIODE	
D927, 928	MA165	DIODE	
D929	LN846RPH	L. E. D.	
D934	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR471, 472	EVJYA1FA5C15	TONE CONTROL	
VR501	EUWMGB025B15	VOLUME CONTROL	
VR502	EVJ02QF02G15	BALANCE CONTROL	
		COIL(S)	
L101	ELESNR68MA	COIL	(E, EB, EP, G, GN)
L101	ELESN1R0MA	COIL	(EG)
L103	ELEXTR47MA9	COIL	
L105, 106	RLQZB822KT-D	COIL	
L151	SLM1B10M-1M	COIL	
L191	ELESNR68MA	COIL	(E, EB, EP, G, GN)
L191	ELESNR56MA	COIL	(EG)
L591, 592	RLQZP1R0KT-Y	COIL	
L601, 602	RLQYR73M	COIL	
L701	SLQZ650MH49	COIL	(E, EB, EG, EP, GN) ⚠
L751	ELESN101KA	COIL	
L901	RLQZP101KT-Y	COIL	
		TRANSFORMER(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
T701	RTP1N5E014-V	POWER TRANSFORMER(MAIN)	(E, EB, EG, EP) ⚠
T701	RTP1N5E015-V	POWER TRANSFORMER(MAIN)	(G) ⚠
T701	RTP1N5E016-V	POWER TRANSFORMER(MAIN)	(GN) ⚠
T751	RTP1I5E003-V	POWER TRANSFORMER(SUB)	(E, EB, EG, EP, GN) ⚠
T751	RTP1I5E005-V	POWER TRANSFORMER(SUB)	(G) ⚠
		COMPONENT COMBINATION(S)	
Z101	RLA6Z005M-T	COMPONENT COMBINATION	(E, EB, EP, G, GN)
Z101	RLA2Z002M-T	COMPONENT COMBINATION	(EG)
Z102	RLI2Z006M-T	COMPONENT COMBINATION	
Z891	RCDHC-278N	REMOTE SENSOR	
		FILTER(S) AND OSCILLATOR(S)	
CF201	RLFFETNGD01L	FILTER	
CF202	RLFFETMGD01L	FILTER	
CF901	EF0EC6004T4	OSCILLATOR(6MHz)	
X101	RSXZ456KM07M	OSCILLATOR(456KHz)	
X102	RLFDGTD01I	OSCILLATOR(10. 65MHz)	
X103	SVQ49U722-S	OSCILLATOR(7. 2MHz)	
		DISPLAY TUBE(S)	
FL901	RSL0155-F	DISPLAY TUBE	
		FM FRONT END PACK ASS'Y(S)	
Z120	ENV17290G1R	FM FRONT END	
		FUSE(S)	
F1	XBA2C16TB0	FUSE, 125V, 1. 6A	⚠
F2	XBA2C31TB0	FUSE, 25V, 3. 15A	(G) ⚠
		SWITCH(ES)	
S701	ESD26840A	VOLTAGE ADJUSTMENT	(G) ⚠
S946	EVQ21405R	NUMERIC 5	
S949	EVQ21405R	NUMERIC 4	
S950	EVQ21405R	NUMERIC 6	
S952	EVQ21405R	NUMERIC 7	
S954	EVQ21405R	CD	
S955	EVQ21405R	TUNER	
S957	EVQ21405R	NUMERIC 9	
S961	EVQ21405R	NUMERIC 8	
S962	EVQ21405R	NUMERIC 0	
S964	EVQ21405R	PHONO	
S966	EVQ21405R	MEMORY	
S967	EVQ21405R	MUTING	
S970	EVQ21405R	TAPE/DCC	

Ref. No.	Part No.	Part Name & Description	Remarks
S971	EVQ21405R	VCR2	
S972	EVQ21405R	VCR1	
S973	EVQ21405R	SP-B	
S974	EVQ21405R	FM MODE	
S975	EVQ21405R	BAND	
S976	EVQ21405R	DIRECT TUNING	
S977	EVQ21405R	TUNING DOWN	
S978	EVQ21405R	POWER	
S981	EVQ21405R	SP-A	
S983	EVQ21405R	NUMERIC 3	
S984	EVQ21405R	NUMERIC 2	
S985	EVQ21405R	NUMERIC 1	
S987	EVQ21405R	TUNING UP	
		RELAY(S)	
RL601, 602	RSY0013M-0	RELAY	⚠
RL751	RSY0019M-0	RELAY	⚠
		CONNECTOR(S) AND SOCKET(S)	
CN101, 102	RJU057W007	SOCKET(7P)	
CN301	RJS1A6603	CONNECTOR(3P)	
CN501	RJU003K010M1	SOCKET(10P)	
CN601	RJU057W004	SOCKET(4P)	
CN651	RJS1A6603	CONNECTOR(3P)	
CN701A	RJS1A6606	CONNECTOR(6P)	
CN701B	RJS1A6604	CONNECTOR(4P)	
CN701C	RJS1A6603	CONNECTOR(3P)	
CN710-716	RJS1A1101T1	CONNECTOR(1P)	
CN751	SJS305-1	CONNECTOR(3P)	(E, EB, EG, EP, GN)
CN751	SJS702-1	CONNECTOR(7P)	(G)
CN901-904	RJU003K008M1	SOCKET(8P)	
CP101, 102	RJT057W007-1	CONNECTOR(7P)	
CP501	RJT003K010-1	CONNECTOR(10P)	
CP601	RJT057W004-1	CONNECTOR(4P)	
CP901-904	RJT003K008-1	CONNECTOR(8P)	
		JACK(S) AND TERMINAL(S)	
HP601	RJJ63TS01	HEADPHONE JACK	
JK101	RJH4202M	ANT TERMINAL	
JK301	SJFK5-1	VCR2 IN TERMINAL	
JK302	SJFD7-6	VCR2 OUT TERMINAL	
JK401	SJF3069N	PHONO/CD TERMINAL	
JK402	SJF3069N	TAPE/VCR2/DCC TERMINAL	
JK403	SJF3069N	VCR1 TERMINAL	
JK406	RJJ33TR01	REMOTE CONTROL OUT TERMINAL	
JK601	RJR0054	SPEAKER(A) TERMINAL	
JK602	RJR0054	SPEAKER(B) TERMINAL	
JK651	RJS1A7402-1	FAN CONNECTOR	
JK791	SJS9236	AC INLET	(E, EB, EG, EP) ⚠

Ref. No.	Part No.	Part Name & Description	Remarks
JK791	SJSD16	AC INLET	(GN) ⚠
JK793	SJS9231-1B	AC INLET	(G) ⚠
		GND PLATE(S)	
E401	SNE1004-2	GND PLATE	
E601	SNE1004-2	GND PLATE	
		FUSE HOLDER(S)	
FC701, 702	EYF52BC	FUSE HOLDER	
FC703, 704	EYF52BC	FUSE HOLDER	(G)

■ RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R103	ERDS2TJ101	1/4W 100
R104	ERDS2TJ102	1/4W 1K
R105	ERDS2TJ471	1/4W 470
R106	ERDS2TJ224T	1/4W 220K
R107	ERDS2TJ471	1/4W 470
R110	ERDS2TJ102	1/4W 1K
R112	ERDS2TJ104	1/4W 100K
R113	ERDS2TJ103	1/4W 10K
R114	ERDS2TJ562	1/4W 5.6K
R115	ERDS2TJ561	1/4W 560
R116	ERDS2TJ102	1/4W 1K
R117	ERDS2TJ473	1/4W 47K
R118	ERDS2TJ562	1/4W 5.6K
R119	ERDS2TJ183T	1/4W 18K
R120	ERDS2TJ473	1/4W 47K
R121	ERDS2TJ332	1/4W 3.3K
R122	ERDS2TJ272T	1/4W 2.7K
R124	ERDS2TJ271	1/4W 270
R125, 126	ERDS2TJ472	1/4W 4.7K
R127	ERDS2TJ103	1/4W 10K
R128	ERDS2TJ820	1/4W 82
R129	ERDS2TJ473	1/4W 47K
R130, 131	ERDS2TJ102	1/4W 1K
R132	ERDS2TJ103	1/4W 10K
R133-137	ERDS2TJ102	1/4W 1K
R139, 140	ERDS2TJ272T	1/4W 2.7K
R141, 142	ERDS2TJ102	1/4W 1K
R143, 144	ERDS2TJ222	1/4W 2.2K
R145, 146	ERDS2TJ102	1/4W 1K (E, EB, EP,
		G, GN)
R145, 146	ERDS2TJ561	1/4W 560 (EG)
R147, 148	ERDS2TJ474	1/4W 470K
R149	ERDS2TJ680T	1/4W 68
R171, 172	ERDS2TJ102	1/4W 1K
R173	ERDS2TJ471	1/4W 470
R175	ERDS2TJ102	1/4W 1K
R176	ERDS2TJ391	1/4W 390
R191	ERDS2TJ103	1/4W 10K (E, EB, EP,
		G, GN)
R192	ERDS2TJ122	1/4W 1.2K (E, EB, EP,
		G, GN)
R193	ERDS2TJ182	1/4W 1.8K (E, EB, EP,
		G, GN)
R194	ERDS2TJ122	1/4W 1.2K (E, EB, EP,
		G, GN)
R195	ERDS2TJ222	1/4W 2.2K (E, EB, EP,

Ref. No.	Part No.	Values & Remarks
		G, GN)
R375, 376	ERDS2TJ102	1/4W 1K
R377, 378	ERDS2TJ223	1/4W 22K
R401, 402	ERDS2TJ102	1/4W 1K
R405-408	ERDS2TJ102	1/4W 1K
R411-416	ERDS2TJ102	1/4W 1K
R417, 418	ERDS2TJ473	1/4W 47K
R419-422	ERDS2TJ104	1/4W 100K
R423, 424	ERDS2TJ102	1/4W 1K
R425-427	ERDS2TJ103	1/4W 10K
R440	ERDS1FVJ820T	1/2W 82 ⚠
R441, 442	ERDS2TJ473	1/4W 47K
R443	ERDS2TJ330	1/4W 33
R451, 452	ERDS2TJ224T	1/4W 220K
R453, 454	ERDS2TJ391	1/4W 390
R455, 456	ERDS2TJ563	1/4W 56K
R457, 458	ERDS2TJ271	1/4W 270
R459, 460	ERDS2TJ680T	1/4W 68
R461, 462	ERDS2TJ184T	1/4W 180K
R463, 464	ERDS2TJ123	1/4W 12K
R465, 466	ERDS2TJ563	1/4W 56K
R467-470	ERDS2TJ102	1/4W 1K
R475, 476	ERDS2TJ471	1/4W 470
R477-480	ERDS2TJ474	1/4W 470K
R481, 482	ERDS2TJ152	1/4W 1.5K
R483, 484	ERDS2TJ392T	1/4W 3.9K
R485, 486	ERDS2TJ223	1/4W 22K
R487, 488	ERDS2TJ392T	1/4W 3.9K
R489, 490	ERDS2TJ222	1/4W 2.2K
R491, 492	ERDS2TJ122	1/4W 1.2K
R493, 494	ERDS2TJ333	1/4W 33K
R501, 502	ERDS2TJ222	1/4W 2.2K
R503, 504	ERDS2TJ103	1/4W 10K
R509-512	ERDS2TJ332	1/4W 3.3K
R525, 526	ERDS2TJ102	1/4W 1K
R528	ERDS2TJ822	1/4W 8.2K
R529	ERDS2TJ824	1/4W 820K
R532-534	ERDS2TJ102	1/4W 1K
R537	ERDS2TJ102	1/4W 1K
R538	ERDS2TJ472	1/4W 4.7K
R547, 548	ERG1SJ820E	1W 82
R591	ERDS1FVJ2R2T	1/2W 2.2 ⚠
R601, 602	ERDS2TJ221	1/4W 220
R603, 604	ERDS2TJ563	1/4W 56K
R605, 606	ERDS2TJ182	1/4W 1.8K
R607, 608	ERDS2TJ563	1/4W 56K
R609, 610	ERDS2TJ100	1/4W 10
R611, 612	ERDS1FVJ100T	1/2W 10 ⚠
R613, 614	ERDS2TJ102	1/4W 1K

Ref. No.	Part No.	Values & Remarks
R615	ERDS2TJ184T	1/4W 180K
R616	ERDS2TJ154	1/4W 150K
R619	ERDS2TJ684	1/4W 680K
R620	ERDS2TJ473	1/4W 47K
R621, 622	ERD25FVJ180T	1/4W 18 ⚠
R623	ERDS2TJ684	1/4W 680K
R624	ERDS2TJ224T	1/4W 220K
R625	ERD25FJ220	1/4W 22 ⚠
R626	ERDS2TJ473	1/4W 47K
R627-630	ERG1SJ101E	1W 100
R631, 632	ERDS2TJ223	1/4W 22K
R633, 634	ERDS2TJ103	1/4W 10K
R635, 636	ERDS2TJ102	1/4W 1K
R637	ERDS2TJ472	1/4W 4.7K
R639, 640	ERDS2TJ474	1/4W 470K
R641, 642	ERDS2TJ221	1/4W 220
R643, 644	ERDS2TJ154	1/4W 150K
R645	ERDS2TJ183T	1/4W 18K
R667, 668	ERG1SJ121E	1W 120
R671-674	ERDS2TJ223	1/4W 22K
R675	ERDS2TJ682T	1/4W 6.8K
R678	ERDS2TJ103	1/4W 10K
R679	ERDS2TJ222	1/4W 2.2K
R680	ERDS2TJ473	1/4W 47K
R681	ERDS2TJ332	1/4W 3.3K
R682	ERDS1FVJ220T	1/2W 22 ⚠
R683	ERDS2TJ103	1/4W 10K
R684	ERDS2TJ153	1/4W 15K
R685, 686	ERDS2TJ333	1/4W 33K
R687	ERDS2TJ103	1/4W 10K
R688	ERDS2TJ222	1/4W 2.2K
R689	ERDS2TJ270T	1/4W 27
R690	ERDS2TJ223	1/4W 22K
R691	ERDS2TJ104	1/4W 100K
R692	ERDS2TJ103	1/4W 10K
R693	ERDS2TJ223	1/4W 22K
R694	ERDS2TJ335T	1/4W 3.3M
R705	ERDS1FVJ6R8T	1/2W 6.8 ⚠
R707	ERDS2TJ332	1/4W 3.3K
R708	ERDS2TJ102	1/4W 1K
R711	ERD25FVJ221T	1/4W 220 ⚠
R714	ERDS2TJ472	1/4W 4.7K
R715, 716	ERDS2TJ1R5T	1/4W 1.5
R717	ERDS2TJ752T	1/4W 7.5K
R718	ERDS2TJ682T	1/4W 6.8K
R719	ERDS1FVJ220T	1/2W 22 ⚠
R721	ERDS2TJ182	1/4W 1.8K
R723	ERD25FVJ4R7T	1/4W 4.7 ⚠
R724	ERDS2TJ122	1/4W 1.2K (E, EB, EG,

Ref. No.	Part No.	Values & Remarks
		EP)
R724	ERDS2TJ222	1/4W 2.2K (G, GN)
R727	ERD25FVJ180T	1/4W 18 ⚠
R728	ERDS1FVJ100T	1/2W 10 ⚠
R729	ERDS2TJ332	1/4W 3.3K
R754	ERDS2TJ102	1/4W 1K
R901	ERDS2TJ102	1/4W 1K
R902	ERDS2TJ681	1/4W 680
R903, 904	ERDS2TJ104	1/4W 100K
R905, 906	ERDS2TJ103	1/4W 10K
R907-911	ERDS2TJ104	1/4W 100K
R912	ERDS2TJ102	1/4W 1K
R913, 914	ERDS2TJ104	1/4W 100K
R920	ERDS2TJ271	1/4W 270
R921	ERDS2EJ121	1/4W 120
R922	ERDS2TJ472	1/4W 4.7K
R923	ERDS2TJ102	1/4W 1K
R926	ERDS2TJ122	1/4W 1.2K
R927	ERDS2TJ181T	1/4W 180
R928	ERDS2TJ222	1/4W 2.2K
R929	ERDS2TJ562	1/4W 5.6K
R930, 931	ERDS2TJ101	1/4W 100
R946-949	ERDS2TJ103	1/4W 10K
R950	ERDS2TJ102	1/4W 1K
R951	ERDS2TJ122	1/4W 1.2K
R952	ERDS2TJ152	1/4W 1.5K
R953	ERDS2TJ182	1/4W 1.8K
R954	ERDS2TJ222	1/4W 2.2K
R955	ERDS2TJ332	1/4W 3.3K
R956	ERDS2TJ472	1/4W 4.7K
R957	ERDS2TJ682T	1/4W 6.8K
R960	ERDS2TJ102	1/4W 1K
R961	ERDS2TJ122	1/4W 1.2K
R962	ERDS2TJ152	1/4W 1.5K
R963	ERDS2TJ182	1/4W 1.8K
R964	ERDS2TJ222	1/4W 2.2K
R965	ERDS2TJ332	1/4W 3.3K
R966	ERDS2TJ472	1/4W 4.7K
R967	ERDS2TJ682T	1/4W 6.8K
R970	ERDS2TJ102	1/4W 1K
R971	ERDS2TJ122	1/4W 1.2K
R972	ERDS2TJ152	1/4W 1.5K
R973	ERDS2TJ182	1/4W 1.8K
R974	ERDS2TJ222	1/4W 2.2K
R975	ERDS2TJ332	1/4W 3.3K
R976	ERDS2TJ472	1/4W 4.7K
R977	ERDS2TJ682T	1/4W 6.8K
R978	ERDS2TJ123	1/4W 12K
R980	ERDS2TJ102	1/4W 1K
R981	ERDS2TJ122	1/4W 1.2K
R982	ERDS2TJ152	1/4W 1.5K
R983	ERDS2TJ182	1/4W 1.8K

Ref. No.	Part No.	Values & Remarks
R984	ERDS2TJ222	1/4W 2.2K
R985	ERDS2TJ332	1/4W 3.3K
R986	ERDS2TJ472	1/4W 4.7K
R987	ERDS2TJ682T	1/4W 6.8K
R991	ERDS2TJ103	1/4W 10K
R1201-1205	ERDS2TJ102	1/4W 1K
R1209-1212	ERDS2TJ102	1/4W 1K
R1214	ERDS2TJ102	1/4W 1K
		CAPACITORS
C101	ECBT1C103NS5	16V 0.01U
C103	ECBT1C103NS5	16V 0.01U
C104	ECBT1H102KB5	50V 1000P
C105	ECBT1H470J5	50V 47P
C106	ECBT1C103NS5	16V 0.01U
C107	ECBT1H473ZF5	50V 0.047U
C108	ECBT1H100JC5	50V 10P (E, EB, EP,
		G, GN)
C108	ECBT1H8R2KC5	50V 8.2P (EG)
C109, 110	ECBT1C103NS5	16V 0.01U
C111	ECEA1EKA4R7B	25V 4.7U
C112	ECBT1C103NS5	16V 0.01U
C113	ECBT1H102KB5	50V 1000P
C114	ECEA1HKA3R3B	50V 3.3U
C115	ECEA1EKA4R7B	25V 4.7U
C116	ECBT1C822MS5	16V 8200P
C117	ECQB1H471JF3	50V 470P
C118, 119	ECQB1H103JF3	50V 0.01U
C120, 121	ECEA1HKA010B	50V 1U
C122	ECEA1HKA2R2B	50V 2.2U
C123	ECEA1HKA010B	50V 1U
C124	ECBT1H102KB5	50V 1000P
C125	ECBT1H150JC5	50V 15P
C126	ECBT1H104ZF5	50V 0.1U
C127	ECEA1CKA220B	16V 22U
C128	ECBT1C103NS5	16V 0.01U
C129, 130	ECEA0JKA101B	6.3V 100U
C131	ECBT1C103NS5	16V 0.01U
C132	ECBT1H102KB5	50V 1000P
C133	ECBT1H150JC5	50V 15P
C134	ECBT1H180JC5	50V 18P
C135, 136	ECBT1C103KS5	16V 0.01U
C137, 138	ECBT1H561KB5	50V 560P
C139, 140	ECQB1H682JF3	50V 6800P
C141-144	ECEA1HKA010B	50V 1U
C145	ECBT1H220JC5	50V 22P
C146	ECBT1H331KB5	50V 330P
C147	ECBT1H102KB5	50V 1000P
C148, 149	ECBT1C103NS5	16V 0.01U
C150	ECBT1H104ZF5	50V 0.1U
C172	ECBT1H331KB5	50V 330P

Ref. No.	Part No.	Values & Remarks
C173	ECEA1CKA220B	16V 22U
C174	ECEA1CKA101B	16V 100U
C175, 176	ECBT1C103NS5	16V 0.01U
C181	ECBT1H471KB5	50V 470P
C196	ECBT1H102KB5	50V 1000P
C375, 376	ECBT1H221KB5	50V 220P
C377, 378	ECBT1H821KB5	50V 820P
C401	ECEA1VKA4R7B	35V 4.7U
C402, 403	ECBT1E103ZF	25V 0.01U
C404	ECEA1VKA4R7B	35V 4.7U
C405	ECBT1H101KB5	50V 100P
C406	ECBT1H102KB5	50V 1000P
C409, 410	ECEA1CKA220B	16V 22U
C411, 412	ECBT1H101KB5	50V 100P
C413, 414	ECEA1CKA100B	16V 10U
C415, 416	ECBT1E103ZF	25V 0.01U
C417, 418	ECBT1H101KB5	50V 100P
C419-422	ECBT1H331KB5	50V 330P
C425, 426	ECBT1H101KB5	50V 100P
C427, 428	ECBT1H221KB5	50V 220P
C431, 432	ECEA1CKA100B	16V 10U
C440	ECBT1E103ZF	25V 0.01U
C451, 452	ECEA1VKA4R7B	35V 4.7U
C453, 454	ECBT1H100JC5	50V 10P
C455, 456	ECBT1H102KB5	50V 1000P
C457, 458	ECEA1AKA330B	10V 33U
C459, 460	ECFR1E223KR	25V 0.022U
C461, 462	ECFR1E682KR	25V 6800P
C463, 464	ECEA1VKA4R7B	35V 4.7U
C465, 466	ECBT1E103ZF	25V 0.01U
C469, 470	ECBT1H181KB5	50V 180P
C471, 472	ECEA1HKA3R3B	50V 3.3U
C475, 476	ECBT1H150J5	50V 15P
C477, 478	ECBT1H221KB5	50V 220P
C479, 480	ECBT1H560J5	50V 56P
C481-484	ECEA1VKA4R7B	35V 4.7U
C485, 486	ECFR1E123KR	25V 0.012U
C487, 488	ECQV1H683JM3	50V 0.068U
C489, 490	ECBT1C562KR5	16V 5600P
C491, 492	ECFR1E273KR	25V 0.027U
C495, 496	ECBT1E103ZF	25V 0.01U
C503, 504	ECEA1VKA4R7B	35V 4.7U
C518	ECEA1HKN010B	50V 1U
C541, 542	ECEA1HN100SB	50V 10U
C543, 544	ECBT1C332KR5	16V 3300P
C591, 592	ECEA0JKA101B	6.3V 100U
C593, 594	ECFR1E104KR	25V 0.1U
C595	ECBT1E103ZF	25V 0.01U
C601, 602	ECEA1EKN2R2B	25V 2.2U
C603, 604	ECBT1H561KB5	50V 560P
C605, 606	ECA1JM330B	63V 33U
C607, 608	ECCR1H100K5	50V 10P

Ref. No.	Part No.	Values & Remarks
C609, 610	ECBT1H151KB5	50V 150P
C611, 612	ECQV1H473JM3	50V 0.047U
C613, 614	ECBA1H681KB5	50V 680P
C615	ECEA2AN2R2SB	100V 2.2U
C616	ECEA2AU100	100V 10U
C617	ECA1HM470B	50V 47U
C618	ECEA2AU100	100V 10U
C621	ECEA2AU100	100V 10U
C623-626	ECKT1H223ZF	50V 0.022U
C627	ECKR2H101KB5	500V 100P
C628	ECBT1H101KB5	50V 100P
C629	ECBT1E223ZF	25V 0.022U
C651	ECEA1HKA2R2B	50V 2.2U
C652	ECEA1CKA100B	16V 10U
C653	ECBT1E223ZF	25V 0.022U
C655	RCE0JKA221BV	6.3V 220U
C701	ECBT1E103ZF	25V 0.01U
C702	ECQE2104KF3	250V 0.1U
C703, 704	ECES56V472NX	56V 4700U (E, EB, EG,
		EP) ⚠
C703, 704	ECES75V752UX	75V 7500U (G, GN) ⚠
C705, 706	ECA1VM472B	50V 4700U (E, EB, EG,
		EP) ⚠
C705, 706	ECA1HM222B	50V 2200U (G, GN) ⚠
C707	RCE1VM101BV	35V 100P
C708	ECKR1H103ZF5	50V 0.01U
C709	ECEA1CKA330B	16V 33U
C710	ECBT1E103ZF	25V 0.01U
C711	ECKR1H103ZF5	50V 0.01U
C712	ECA1HM470B	50V 47U
C713	ECKR1H103ZF5	50V 0.01U
C716	ECEA2AU100	100V 10U
C720	ECEA1EKA220B	25V 22U
C722	ECQE2104KF3	250V 0.1U
C751	ECKWNS102MBM	400V 1000P ⚠
C752	ECKR1H103ZF5	50V 0.01U
C753	ECA1EM102B	25V 1000U ⚠
C754	ECBT1E103ZF	25V 0.01U
C756	ECBT1E103ZF	25V 0.01U
C757	ECEA1CKA470B	16V 47U
C758	ECEA1AKA101B	10V 100U
C759	ECEA1EKA220B	25V 22U
C891	ECFR1E392KR	25V 3900P
C901	ECA0JM102B	6.3V 1000U
C902	ECBT0J223MS5	6.3V 0.022U (E, EB, EG,
		EP)
C902	ECBT1E103ZF	25V 0.01U (G, GN)
C903	ECBT1E103ZF	25V 0.01U
C904	ECA0JM471B	6.3V 470U
C906	ECEA0JKA101B	6.3V 100U
C908, 909	ECBT1E103ZF	25V 0.01U
C911, 912	ECEA2AU100	100V 10U

Ref. No.	Part No.	Values & Remarks
C913, 914	ECEA1VKA100B	35V 10U
C916	ECEA1HKA010B	50V 1U
C920	ECEA1HKA010B	50V 1U
C921-928	ECBT1H331KB5	50V 330P
C929-932	ECBT1H101KB5	50V 100P

910

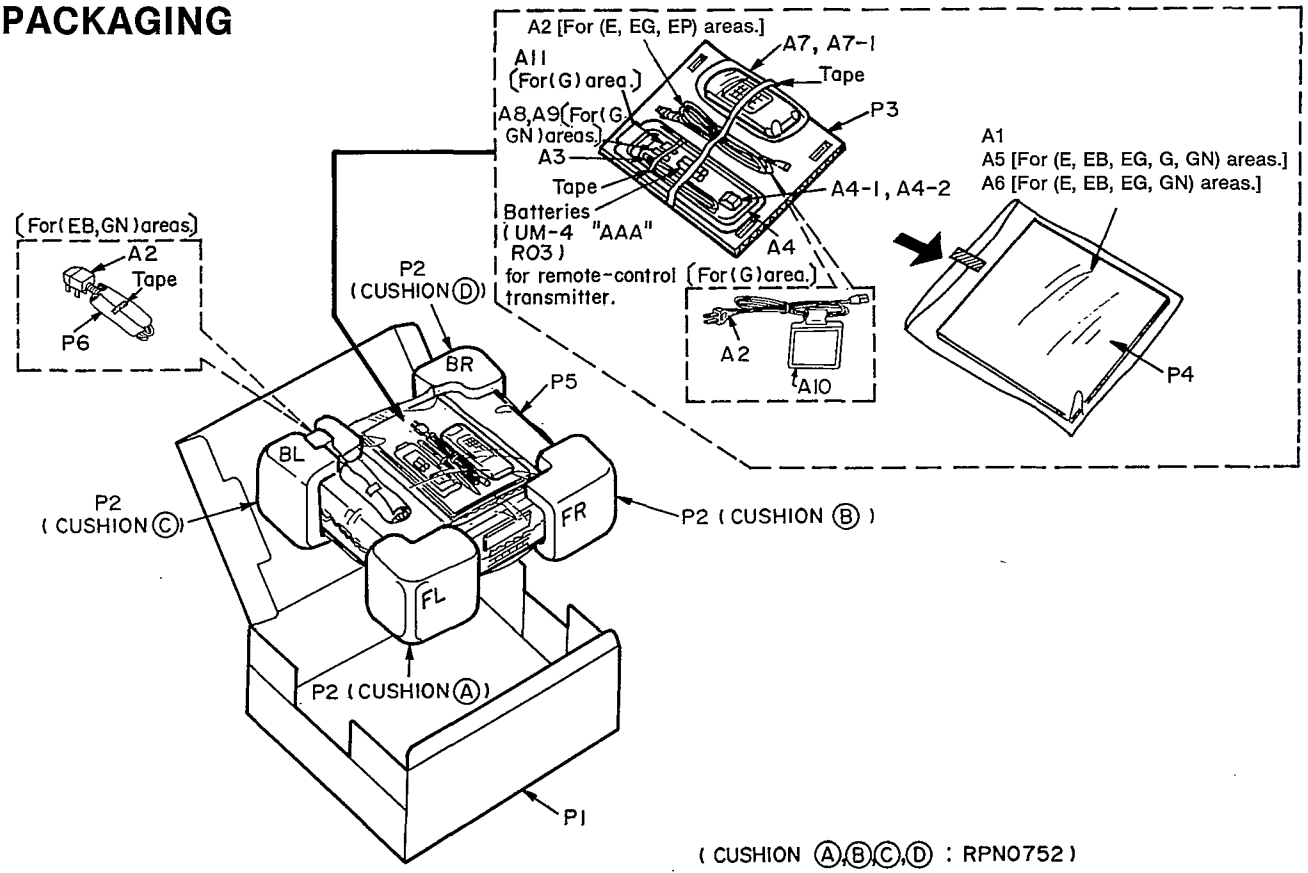
■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y: Supply period for three years from termination of production.
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPG2062	PACKING CASE	(E, EG, EP, G, GN)
P1	RPG2063	PACKING CASE	(EB)
P2	RPN0752	CUSHION	
P3	RPQ0164	PAD (ACCESSORIES)	
P4	XZB24X34C04	PROTECTION BAG (ACCESSORIES)	
P5	XZB60X65A01Z	PROTECTION BAG (UNIT)	
P6	RPH0032	PROTECTION SHEET	(EB, GN)
		ACCESSORIES	
A1	RFKSAGX170E	INSTRUCTION MANUAL ASS'Y	(E)
A1	RFKSAGX170G	INSTRUCTION MANUAL ASS'Y	(G)
A1	RQT2458-B	INSTRUCTION MANUAL	(EB, GN)
A1	RQT2456-D	INSTRUCTION MANUAL	(EG)

Ref. No.	Part No.	Part Name & Description	Remarks
A1	RQF2297	INSTRUCTION MANUAL ASS'Y	(EP)
A2	RJA0019-2K	AC POWER SUPPLY CORD	(E, EG, EP, G) ⚠ (SF)
A2	VJA0733	AC POWER SUPPLY CORD	(EB) ⚠ (SF)
A2	RJA0036-K	AC POWER SUPPLY CORD	(GN) ⚠ (SF)
A3	RSA0007	FM INDOOR ANTENNA	
A4	RSA0010	AM LOOP ANTENNA SET	
A4-1	RMN0244	AM ANTENNA HOLDER	
A4-2	XTN3+10AFZ	SCREW	
A5	RQCB0169	SERVICENTER LIST	(E, EB, EG, G, GN)
A6	RQA0013	WARRANTY CARD	(E, EB, EG)
A6	RQX7433ZA	WARRANTY CARD	(GN)
A7	RAK-SA113XH	REMOTE CONTROL TRANSMITTER	
A7-1	RKK0057-K	BATTERY COVER	FOR R/C TRANSMITTER
A8	SJP9009	ATTACHMENT PLUG	(EB) ⚠
A9	RFE0014	ANTENNA PLUG	(G, GN)
A10	RQLA0134	VOLTAGE CAUTION LABEL	(G)
A11	SJP5213-1	POWER PLUG ADAPTOR	(G) ⚠

■ PACKAGING



(CUSHION Ⓐ,Ⓑ,Ⓒ,Ⓓ : RPN0752)

Printed in Japan
H940511500 NH/YU/TM